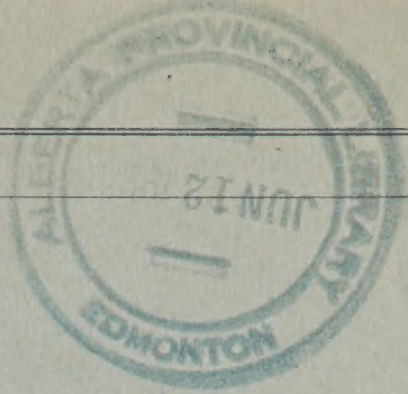


CA2 ALQ6  
50 H23  
June 8/50  
Vol 10



# The Province of Alberta

## PETROLEUM AND NATURAL GAS CONSERVATION BOARD

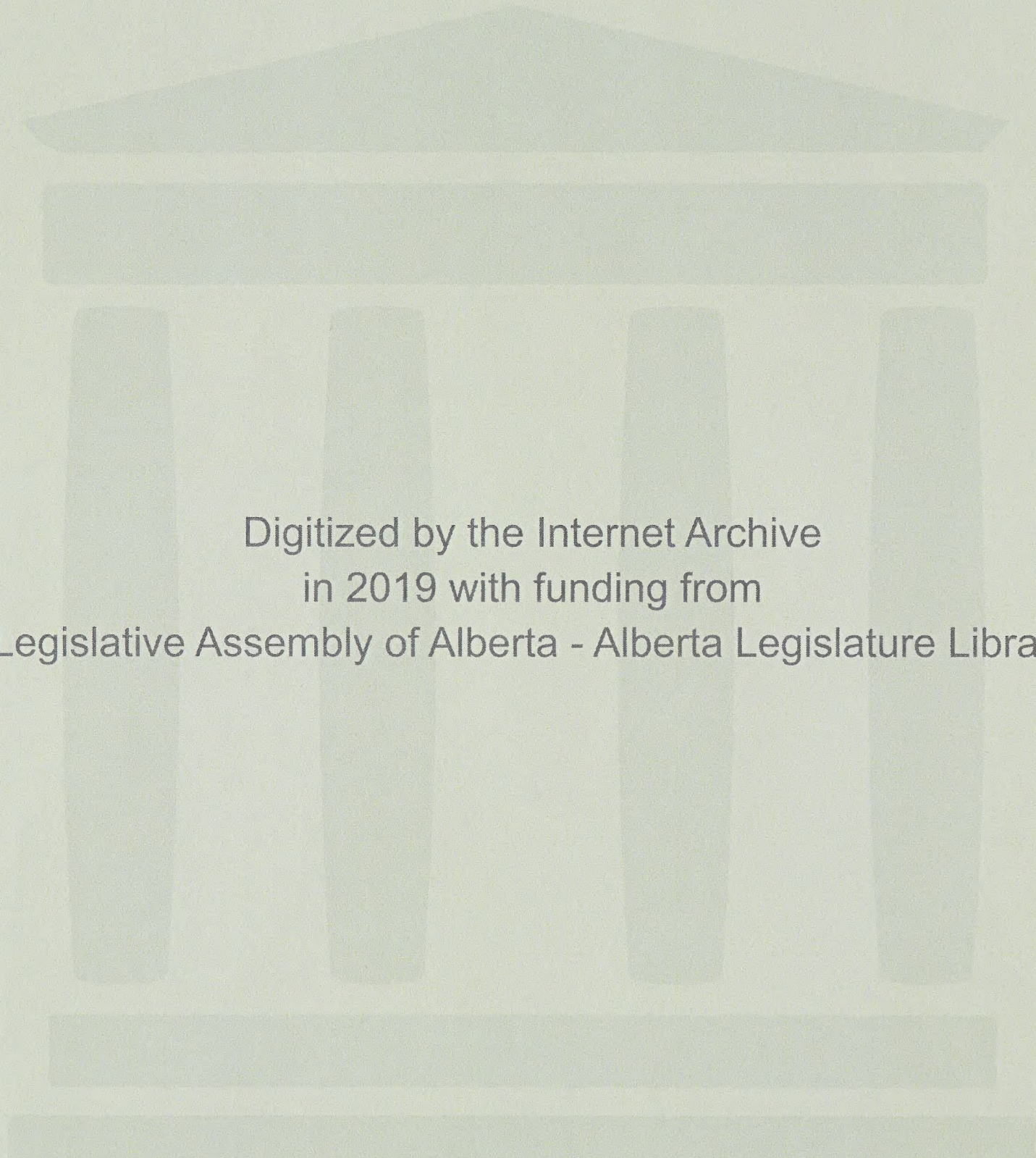
Application for Permission to Remove or cause to be removed  
Natural Gas from the Province of Alberta, under the Provisions of the  
Gas Resources Preservation Act by Northwest Natural Gas Company  
and Alberta Natural Gas Grid, Ltd.

I. N. McKinnon Esq., Chairman  
D. P. Goodall Esq.  
Dr. G. W. Govier

**Session:** JUNE 8th, 1950.

**Volume** 10





Digitized by the Internet Archive  
in 2019 with funding from  
Legislative Assembly of Alberta - Alberta Legislature Library



# I N D E X

VOLUME 10.

June 8th, 1950.

## W I T N E S S E S

Page

### D. S. GOODBODY

|  |     |
|--|-----|
| Cross-Examination by Mr. D.P. McDonald,              | 733 |
| Discussion re Field Notes, . . . . .                 | 753 |
| Cross-Examination by Mr. D.P. McDonald,              | 767 |
| Direct Examination by Mr. Nolan , . . .              | 771 |
| Cross-Examination by Mr. D.P. McDonald,              | 785 |
| Cross-Examination by Mr. Mahaffy, . . .              | 801 |
| Cross-Examination by Mr. Martland , . .              | 809 |
| Cross-Examination by Mr. S.B. Smith , .              | 811 |
| Cross-Examination by Mr. D.P. McDonald,              | 826 |
| Cross-Examination by Mr. D.E. Smith , .              | 828 |
| Discussion re Prairie Transmission<br>Lines Limited, | 829 |

### ARTHUR B. ALLYNE

|   |     |
|---|-----|
| Direct Examination by Mr. Nolan , . . . | 830 |
| Cross-Examination by Mr. D.P. McDonald, | 855 |
| Cross-Examination by Mr. S.B. Smith , . | 865 |
| Cross-Examination by Mr. C.E. Smith, .  | 875 |
| Cross-Examination by Mr. D.P. McDonald, | 876 |

## E X H I B I T S

No.

|    |   |     |
|----|---|-----|
| 17 | Strip Map re Alberta Natural Gas Company<br>Preliminary Survey, Gas Transmission Pipe<br>Line, Yahk, B.C., to New Westminster, B.C.,<br>Route A, . . . . .  | 770 |
| 18 | Strip Map re Alberta Natural Gas Company<br>and Northwest Natural Gas Company,<br>Projected Natural Gas Transmission System,<br>Macleod, Alberta, to Aldergrove, B.C.,<br>Sections A to T , . . . . . | 770 |
| 19 | Maps and Aerial Photographs, . . . . .  | 774 |
| 20 | Portfolio of Photographs, . . . . .   | 837 |
| 21 | Brief prepared by Ebasco Services, Inc., .  | 838 |
| 22 | Map of proposed Hope-Princeton-Flood Pipe<br>Line, Detail of Tentative Proposed Route,  | 842 |
| 23 | Recap of Field Survey Notes, submitted by<br>Mr. Allyne, . . . . .  | 842 |

Page 1 of 1

1. Introduction

2. Methodology

3. Results

The first part of the study was to identify the main factors influencing the process. This was done by conducting a series of interviews with experts in the field. The results of these interviews were then used to develop a model of the process. The model was then tested using a series of experiments. The results of these experiments were then used to validate the model. The final part of the study was to discuss the implications of the findings for practice.

4. Discussion

The findings of this study have several implications for practice. First, they suggest that the main factors influencing the process are the quality of the data and the quality of the analysis. Second, they suggest that the model developed in this study can be used to predict the outcome of the process. Third, they suggest that the model can be used to identify the areas where the process is most likely to fail.

5. Conclusion

6. References

The study was conducted in accordance with the principles of good research practice. The data were collected from a range of sources and were analysed using a range of statistical techniques. The results of the study are presented in the form of a series of tables and graphs. The study was funded by the Department of Health and Social Care. The authors would like to thank the following people for their assistance: Dr. John Smith, Dr. Jane Doe, and Dr. Michael White.



I N D E X - Page 2.

EXHIBITS cont.

| <u>No.</u> |   | <u>Page</u> |
|------------|---|-------------|
| 24         | Recap of Construction Details obtained from Field Survey submitted by Mr. Allyne, . . .   | 844         |
| 25         | Album of Photographs, . . . . .   | 846         |
| 26         | Princeton-Hope-Flood Pipe Line Cost Estimate, Construction only, submitted by Mr. Allyne, | 849         |
| 27         | 89 Field Sheets of Mr. Allyne's , . . . .   | 854         |



EXHIBIT 1001

Page 2

Page 2

24. Report of investigation - results obtained from  
field survey conducted by Mr. [Name],  
[Date]  
25. [Name] of [Location]  
26. [Name] of [Location]  
27. [Name] of [Location]

[Faint text]



D. S. Goodbody,  
Cr. Exam. by Mr. D. P. McDonald.

- 733 -

VOLUME 10.

June 8th, 1950.

D. S. GOODBODY, recalled, already  
sworn, examined by Mr. McDonald, testified:

Q Mr. Goodbody, I was going to question you this morning with regard to the tables attached to your Exhibit 15, which deals with Route B. I had in mind the second page of the tables, The Gathering System in Alberta?

A Yes.

Q And I wanted you to deal with the matter of pipe materials. Could you tell me what is the basis of the cost item of \$125.00 per ton for the 24-inch and 20-inch?

A Those are approximate quotations that we received.

Q And the \$125.00 is f.o.b. the mill?

A That is right.

Q From what mills did you obtain quotations?

A Oh, we had quotations from A. O. Smith, and Kaiser, and Consolidated Western.

Q A. O. Smith is in Milwaukee?

A Yes.

Q And Kaiser is in?

A Montana. My quotation came from people in California for Consolidated Western.

Q Consolidated Western is San Francisco?

A Yes, and Los Angeles.

Q Then the item of freight, \$46,852.000 how did you arrive at that?

A Well that is an accumulation of the freight that we thought it would take to come in here, freight quotations that we



Exhibit 10

June 2, 1954

Exhibit 10  
June 2, 1954

Exhibit 10  
June 2, 1954

Exhibit 10  
June 2, 1954

Exhibit 10  
June 2, 1954

Exhibit 10  
June 2, 1954

Exhibit 10  
June 2, 1954

Exhibit 10  
June 2, 1954

Exhibit 10  
June 2, 1954

Exhibit 10  
June 2, 1954

Exhibit 10  
June 2, 1954

Exhibit 10  
June 2, 1954

Exhibit 10  
June 2, 1954



D. S. Goodbody,  
Cr. Ex. by Mr. D. P. McDonald.

- 734 -

had from different railroads and steel companies also included freight in their quotations.

Q And this is based on current freight rates?

A Yes, current freight rates.

Q Well, I won't question you any more in connection with that item. We will take the main line in Alberta and British Columbia, and with regard to pipe I presume the same mill is quoted?

A Yes.

Q And that quotation is the basis of the \$125.00 per ton?

A Yes.

Q Now, you have an item of freight \$16.00?

A That is correct.

Q Now, from what point did you calculate freight?

A That freight is calculated from Los Angeles to Spokane and Seattle. It is an average freight of an over-all picture. It is an approximate freight rate covering from Spokane and Seattle.

Q From Los Angeles?

A From Los Angeles.

Q And to Seattle?

A To Seattle or to Spokane.

Q To Seattle or to Spokane?

A Yes.

Q Then you have not calculated freight from Spokane to say Fernie or some point there?

A That is all included in the installation costs from there on. I can explain that. This is all set up on the basis of bringing the pipe into a local plant and coating it in a







D. S. Goodbody,  
Cr. Ex. by Mr. D. P. McDonald.

- 735 -

local plant and hauling it direct from the plant to the job.

Q And in what lengths would you haul it?

A Well, whatever length the State would let us haul it. It would be governed by law.

Q As to the size of your trailers?

A We would try to stay out of jail and get all we could on the trucks.

Q So that I take it, then, your main plant to the eastern end of your line would be at Spokane. Is that what you have in mind?

A That is the basis of this figure, yes.

Q And then any additional freight from Spokane to, say, Pincher Creek is added in on your installation cost?

A The freight from there was -- the haul was averaged from these local points over the entire job and it is all set up on that basis.

Q Now, did you calculate a similar freight rate from Milwaukee?

A I had it and discarded it. This is the best thing that I have seen so far and as far as you can go until you have a job on your hands and go out and purchase.

Q Now, does this include water transportation to Seattle?

A No. No water transportation is included.

Q Could you tell me about coating, the next item?

A As I said the other day, I had a straight figure on the coating from a coating contractor and this is the result of his figure.

Q And the coating contractor would operate not only in Canada but in the United States too?

A He would operate wherever it was best to set up. As I said,







D. S. Goodbody,  
Cr. Ex. by Mr. D. P. McDonald.

- 736 -

this is all set up on the basis of a central plant, of locating a central plant, and doing it there, you see, not coating on the job.

Q All the coating you would do on the job would be the joints?

A The joints, that is right.

Q And was this quotation on the basis of a mile of pipe?

A The basis was on mile of pipe, yes. We did not figure, however, that we would have to coat the entire length, about 80% of the total line.

Q Now, just so as to have some idea of your coating practice, would you have one, two or three coating stations?

A Well, as I have said, this is set up on the basis of two coating stations, one in Spokane and one in Seattle, and we would haul from those points to the various places.

Q Well is that common practice in pipe line installation to haul coated pipe that distance?

A No. The reason we did this was because of the inclement weather, we were going to get considerable rain and they have had considerable trouble in rough country with coating, and we felt we would be better off to have the pipe coated and go out on the job coated.

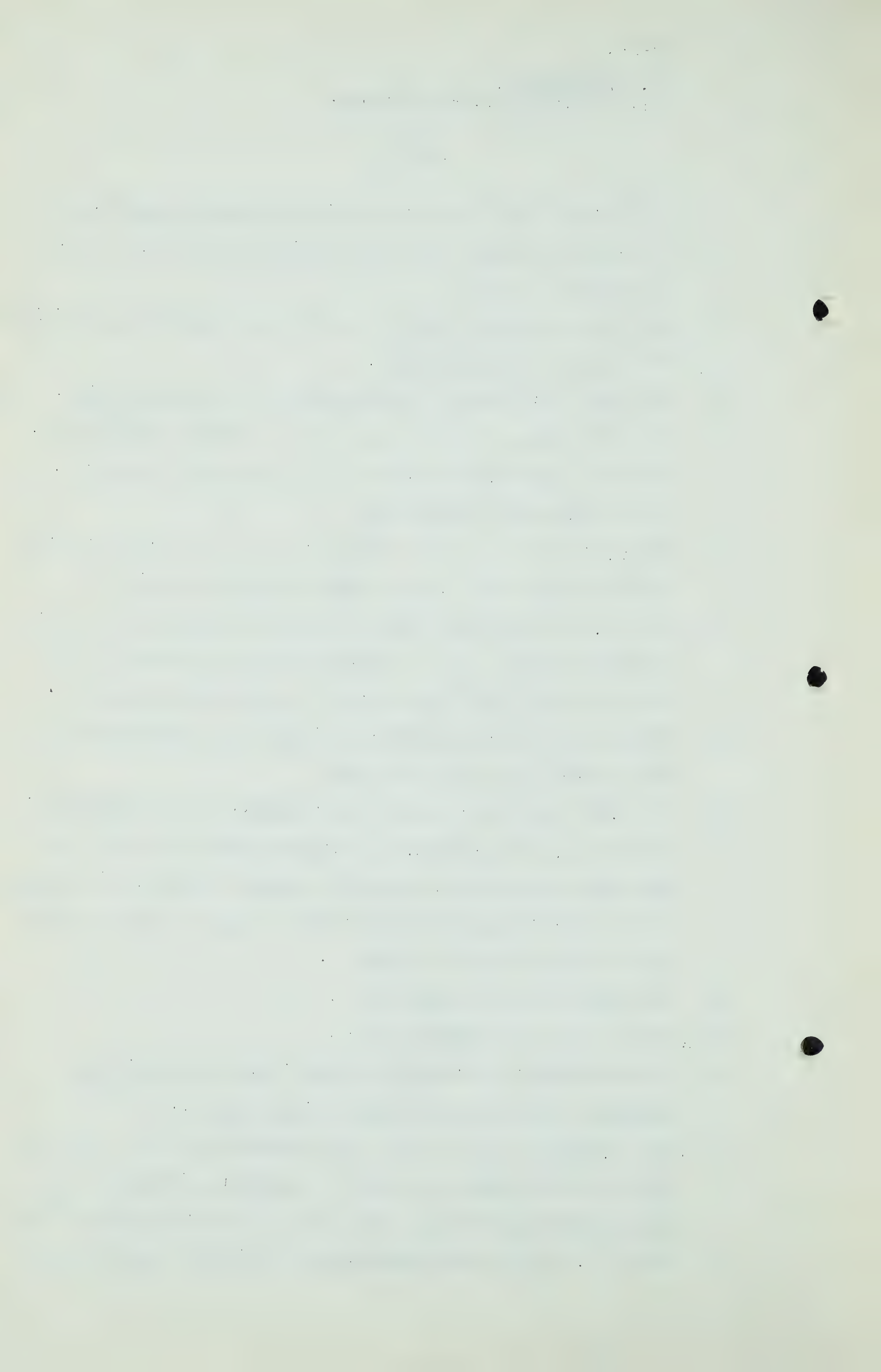
Q And this is a new departure?

A Oh, no, not a new departure.

Q I am thinking of transporting pipe, say 300 miles from Spokane to Fernie or the Crow's Nest area?

A No, I would not say it is a new departure at all. The line for the basic magnesium plant in Nevada is coated in Los Angeles and hauled out. Some came in from Bethlehem in the east. It is not a new departure. We do that quite often.







D. S. Goodbody,  
Cr. Ex. by Mr. D. P. McDonald.

- 737 -

It is done and it is a matter of opinion which is the best. Some jobs will be better coated in the yard and some outside. It is our opinion it is better to coat this under cover.

Q My understanding is the freight rate from Los Angeles to Spokane is \$16.00. Am I right on that?

A Well, I said the average between the two places. Now, I don't remember what it is. It is \$15.50 or \$14.75 or something like that.

Q To Seattle?

A To Spokane and the Seattle is almost the same. It is a covering figure.

Q Well, would you transport from Spokane, for instance, to the Crow's Nest area by truck?

A Yes.

Q There would be no further railway freight?

A No. This is all set up on the basis of - -

Q So that your additional cost would be in the hauling string item of costs?

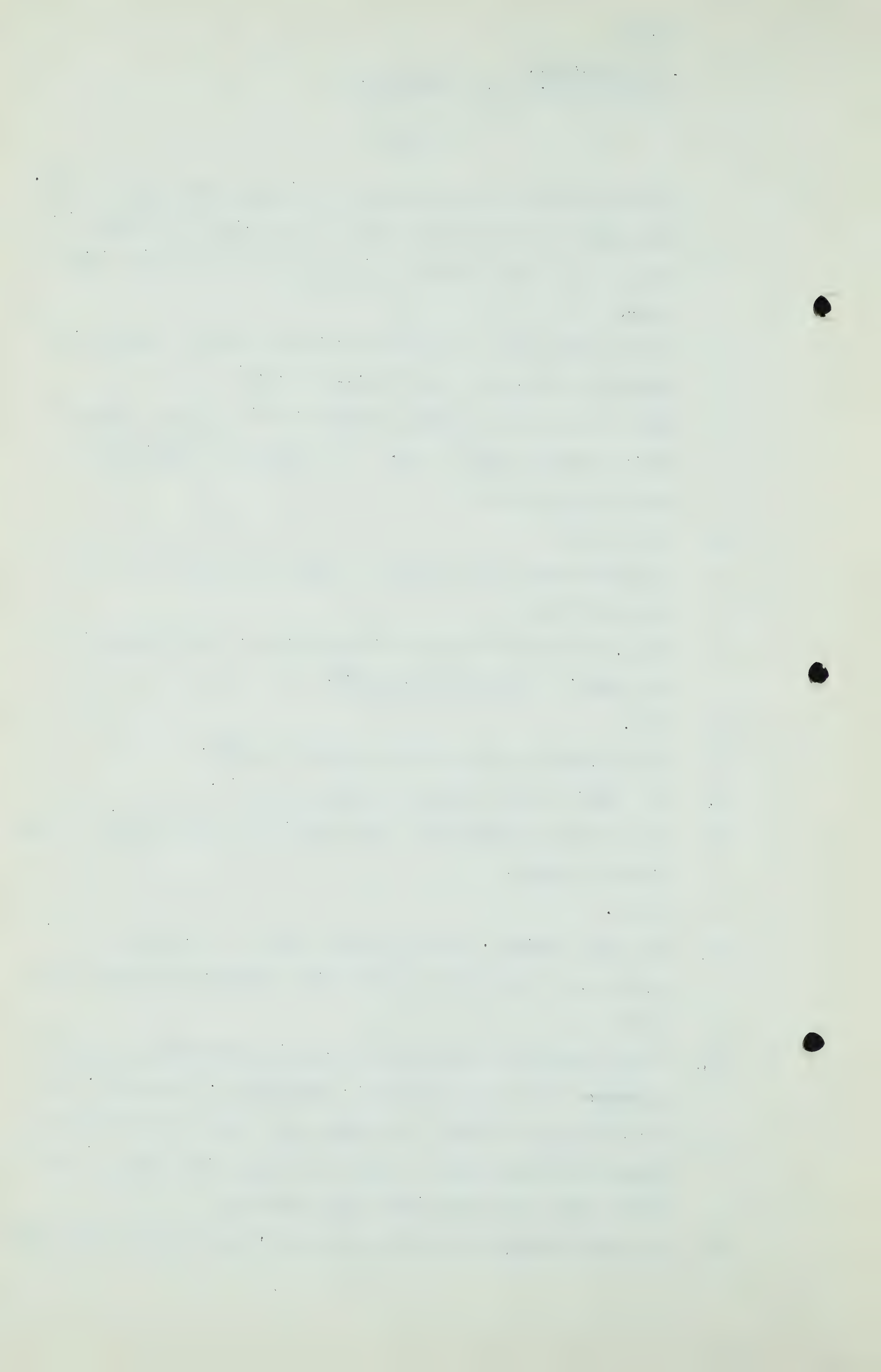
A Yes.

Q Now your valves. Where did you intend to purchase your valves, or where did you get this quotation that you have here?

A This quotation came from Worthington, Wallworth, I don't remember where it came from. Wallworth, I believe. And they have got a plant in Canada and a plant in the United States and the figure is about the same, and this is the figure that the man in New York gave me.

Q Now with regard to river crossings, item 6 on the next page,







D. S. Goodbody,  
Cr. Ex. by Mr. D. P. McDonald.

- 738 -

you have a lump sum of \$350,050.00. How many river crossings are by overhead bridge?

A We have thought of those practically all by overhead.

Q All by overhead?

A Yes.

Q And this item here includes the excavation for the foundations of your piers?

A Yes.

Q And your cables and so forth to string your line?

A Yes, I estimate the length in there because of the smaller ones we had in there. I was going to say I could tell you about what that was per foot, but we have used two prices on it so I cannot.

Q What are the two prices?

A I used \$40.00 a foot for those under 75 feet and a flat \$140.00 a foot for those over.

Q \$140.00 over 70 feet?

A Yes, over 75.

Q And do you recollect the footage of the short ones and the footage of the long ones?

A No, I do not remember that.

Q Now, just one other item here, Communication System, item 13. What type of communication system did you have in mind?

A That is the result of a quotation from one of the radio people and it is based on a short wave radio communication, the standard short wave.

Q And you had a quotation on it?

A I had a quotation from the radio people.

Q What radio people was it?





D. S. Goodbody,  
Cr. Ex. by Mr. D. P. McDonald.

- 739 -

A Motorola.

Q Now let us come back to Item No. 5, Installation Cost. Have you a different itemized cost for installation in Canada than you have in the United States portion of the line?

A The same units were used all the way through, the same wage rates, the same equipment rates, the same rates used on everything. We have not made any change at all.

Q You have taken the same units and they have been applied from Pincher Creek to Vancouver to Portland?

A Everything that we figured. We have not made any variation in the basis.

Q Now would you give me the detail of how you arrive at your unit cost and what your unit cost is for clearing right-of-way?

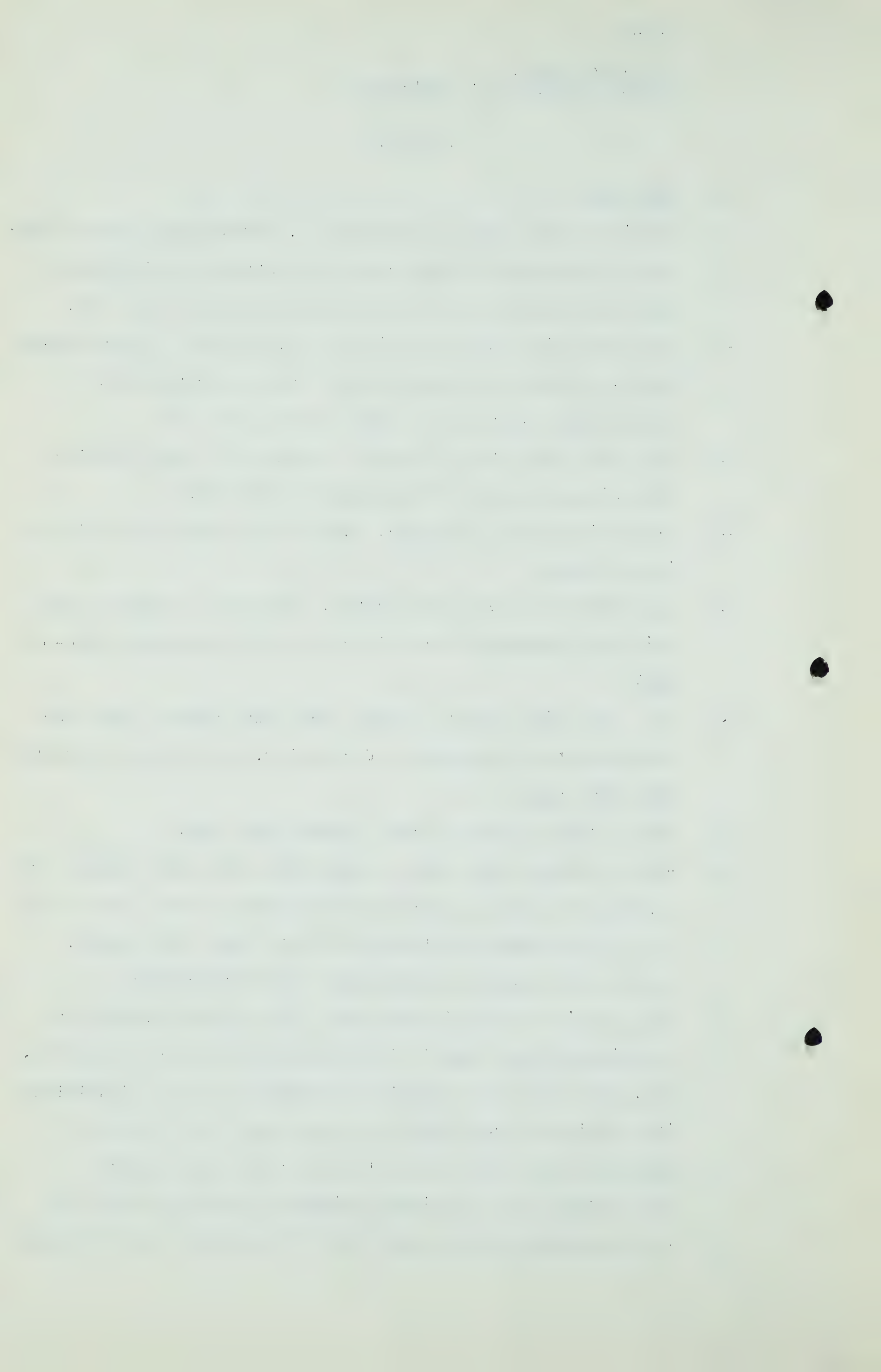
A No. The unit cost was set up and it was broken down into four different categories of clearing, and I do not remember what they were.

Q Well I would kind of like to know about that?

A Well, anybody would like to know what your unit charges are. Anyone would like to have your information and I am sure it is not the normal practice, I do not think, for people, contractors anyhow, to hand what they have around.

Q Well aren't we in this position, that you are placing it in evidence here that it is costing you so much to do this. Now, the only way I can find out whether you are justified in arriving at the figure you have here is to find out what your unit costs are. I mean, how do you arrive at your costs? You are giving evidence here as to what this line is going to cost and I want to know what your clearing





D. S. Goodbody,  
Cr. Ex. by Mr. D. P. McDonald.

- 740 -

right-of-way is?

A This is all the detail that we are prepared to give at the present time. I have not the other in hand to give and I cannot break this down by memory, surely.

Q We will just leave that now. We will come to Trench Excavations, or Excavation, as you call it?

A Yes.

Q Before we leave this clearing right-of-way, you mentioned four classifications. Can you tell us the four classifications?

A I classified it as Very Light, Light, Medium and Heavy.

Q Yes. Now we will come to your Excavation. Can you give me the unit cost on your excavation?

A No. The same thing applies to it.

Q Now have you any classification of excavation?

A Surely. We break it down into Common, and Gravel and Rock.

Q And then have you a unit cost per backfill?

A Yes. That was a single unit cost and not broken down into classifications.

Q No, there was no classification at all?

A No.

Q Are you prepared to give me your unit cost in regard to that?

A No. I do not remember it.

Q Now your next item is Pipe Placement. Now, just what do you mean by that, Mr. Goodbody?

A Well, it takes in all the items normally after the excavation until the backfill.

Q That means lifting the pipe and putting it in the trench?

A Yes.





D. S. Goodbody,  
Cr. Ex. by Mr. D. P. McDonald.

- 741 -

- Q Now we come to Bends. How do you arrive at the number of bends in order to get your unit and accumulated costs?
- A I have classified the country under flat, semi-rolling, rolling and rough country.
- Q How many bends do you have? In flat country you would not have any bends?
- A Up to 5 bends per mile.
- Q And your rolling?
- A Semi-rolling would be up to 10.
- Q Rolling, 10?
- A Semi-rolling.
- Q Was 10?
- A Yes.
- Q Yes, and rolling?
- A And rolling was 10 to 15.
- Q Yes?
- A And rough was 15 to 25.
- Q 15 to 25?
- A Yes.
- Q And that was flat - -
- A Flat, semi-rolling, rolling and rough.
- Q Welding, you simply divided the length of line by the length of your joints?
- A No, that was classified with the same classifications and will vary in rough country.
- Q It varies in rough country?
- A Yes.
- Q More welds in rough country?
- A No, it is hard to get men in. That has to be considered,





D. S. Goodbody,  
Cr. Ex. by Mr. D. P. McDonald.

- 742 -

people getting in and the working conditions.

Q Well now, just before I leave bends, can you give me the item or unit cost for bends which you used?

A No.

Q Welding the same?

A Welding the same.

Q Can you tell me how much you increased your ordinary welding by percentage, say?

A No, I cannot.

Q You cannot tell me that?

A No.

Q Coating we have already dealt with?

A Yes.

Q Then we come to valves. There is a unit cost for the installation of valves?

A Yes.

Q Can you give me that?

A No. I do not remember exactly what it was.

(Go to page 743.)





D. S. Goodbody,  
Cr. Ex. by Mr. D. P. McDonald.

- 743 -

Q Now, so that deals, Mr. Goodbody, with the main line in Alberta and British Columbia?

A Yes.

Q I just wanted to look at the sales lateral which deals with the International Border to Waneta and Trail?

A Yes.

Q You have made a unit cost for pipe per ton of \$115.00, you have a unit cost of that for pipe per ton?

A Yes.

Q Is that a quotation on a 12 $\frac{3}{4}$  inch line?

A Yes.

Q Now, is your freight there freight through Spokane?

A No, that pipe has to come from another source in the East and the freight is higher.

Q Now, you have made an estimate in Item 5 in this Table, "River Crossings" \$61,250.00?

A Pardon me just a minute. I am looking at the wrong Table here.

Q It is the Trail to Waneta one?

A Yes, I have it here. I am sorry, I was on the wrong Table.

Q The fourth page of Tables?

A \$61,000.00, that is overhead.

Q Overhead?

A Yes.

Q How many feet of overhead have you in mind there?

A I do not remember.

Q Now, is that at \$170.00 per foot or \$140.00 per foot?

A You have got the wrong figure.

Q \$40.00 or \$140.00?

A It contains both of them.





D. S. Goodbody,  
Cr. Ex. by Mr. D.P.McDonald

- 744 -

Q Now, we come to main line construction in the United States. You have already dealt with the material, the matter of pipe and cost per ton?

A Yes.

Q Now, the valves again are priced on quotations that you received from the same Company?

A Yes.

Q From the United States plant?

A Yes.

Q And they include freight and sales tax, do they?

A They include freight. They include everything that would go into their cost.

Q They include everything that would go into their cost?

A Yes.

Q And it is the price delivered at, say, Spokane?

A The price that they gave me was laid down any place as far as freight was concerned.

Q Yes, all right. Now, when we come to Installation Costs, you give me the same answers as you gave before?

A Yes.

Q Well, we will deal with that subsequently. Now, let us come to River Crossings, Mr. Goodbody. That is Item 6 in this Main Line in the United States. You have got \$2,028,100.00. Now, can you tell me how many crossings there are?

A No, I do not remember the number.

Q You do not remember the number?

A No.

Q You cannot tell me how many bridges there are?

A No, I cannot. It is set up on the same basis as the others





D. S. Goodbody.  
Cr. Ex. by Mr. D. P. McDonald.

- 745 -

and they are innumerable.

Q What is your unit cost in connection with this main line in the United States?

A The same as anywhere.

Q The same as anywhere?

A Yes. As I say, I have used the same unit cost over the entire line.

Q And did you give consideration to the varying foundations at different points, the cost of putting in your piers?

A This is a very preliminary survey, and we have not made any foundation soundings.

Q As I read your text, you have an 1800 foot span crossing the Columbia River, is that right?

A Yes.

Q And this will carry the 24 inch pipe coated?

A Yes.

Q And I presume the pipe will be cradled and so forth to hold it up?

A Yes.

Q How many piers do you build, or is that one span, one span of 1800 feet?

A We have not attempted to design a bridge. We have made an allowance, as I have said, of so much a foot.

Q Am I right in saying that the 1800 feet....

A There will be an 1800 foot bridge across there.

Q At \$140.00 a foot, that would be an expensive one, wouldn't it?

A Surely it would be expensive. That wouldn't be too expensive at one place where there are fillings.

Q It wouldn't be?





D. S. Goodbody,  
Cr. Ex. by Mr. McDonald

- 746 -

A No.

Q I want to get you correct on this, my calculation at \$140.00 a foot for 1800 feet is \$252,000.00. Is that what you have in mind for this Columbia River crossing?

A No, I do not think that you can take any one crossing there. I have got 75 foot crossings for \$140.00 a foot. I do not think you can take one crossing and break it down. It is an average, and we are still in the preliminary stage.

Q It is still a fairly preliminary estimate?

A Yes.

Q Now, how many under water crossings have you got, can you tell me?

A At the present time the only one that might possibly go under the water is the one at Sedro Woolley.

Q Can you tell me what is the unit cost per foot that you have allowed for that?

A No, I do not remember that. I have not made any difference in it at all. It is a lump sum.

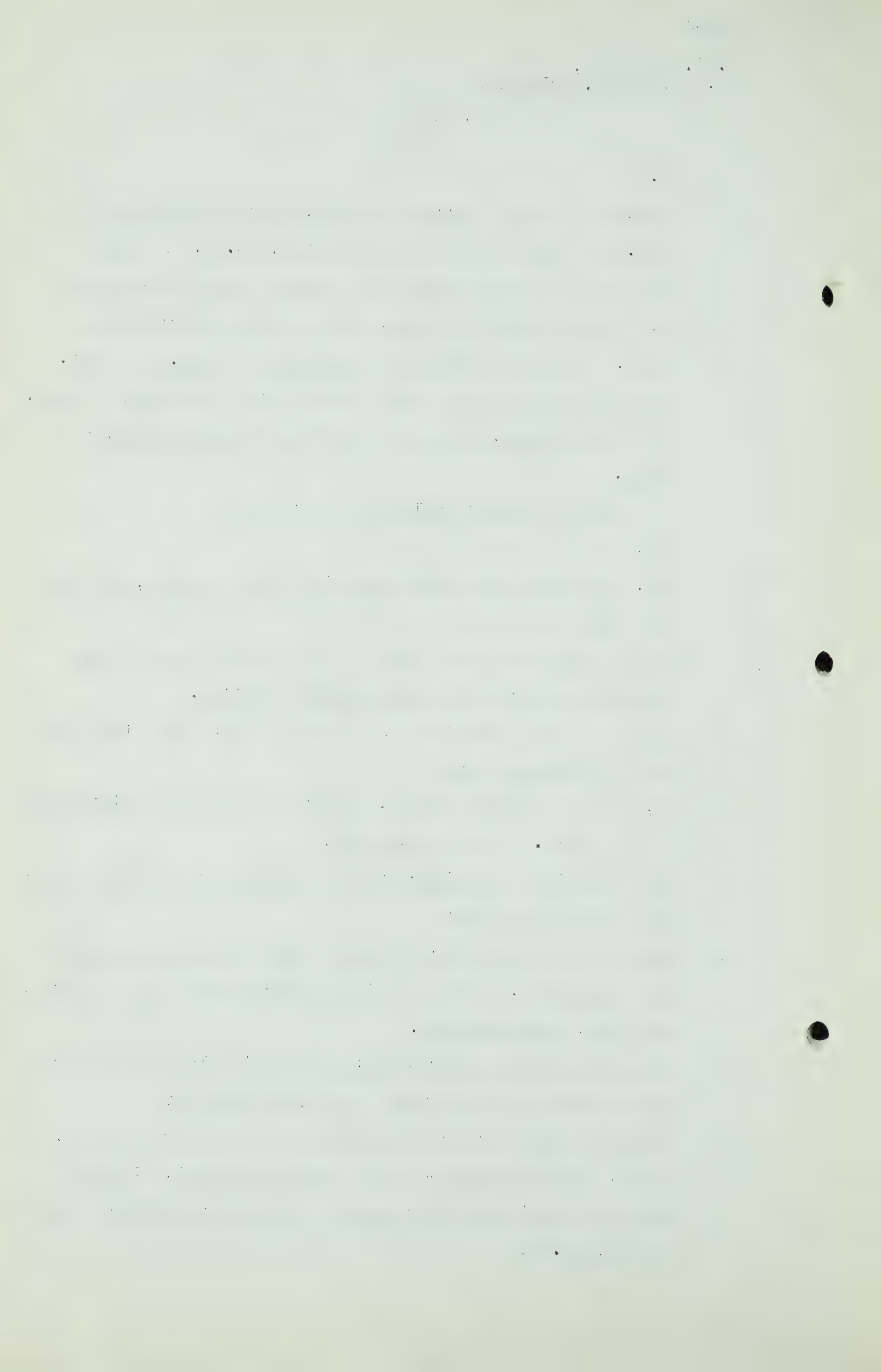
Q Have you given consideration to laying more than one pipeline under the water?

A Well, that is a matter of policy that somebody else will have to decide. I have a single set-up and I have allowed, as I say, the same unit.

Q So that you have not got whether you will lay two or three under water crossings under the Sedro Woolley?

A If we can find a place to go over it we will go over it.

Q I see. Then we come to Purge, Clean and Test. Did you work out a unit cost for that? You have an estimate here of \$84,500.00?





D. S. Goodbody,  
Cr. Ex. by Mr. McDonald

- 747 -

A No, that was just a lump figure. That was given to me by an engineer.

Q And your communication system in the United States is based on those quotations?

A Yes.

Q Now, I think, Mr. Goodbody, you dealt with the Longview Bridge. You mentioned you were going to cross the Columbia in the vicinity of Portland and the Longview Bridge?

A In the vicinity of the Longview Bridge.

Q In the vicinity of the Longview Bridge?

A Yes.

Q That is within some miles of Portland?

A That is 40 or 50 miles.

Q Now, can you tell me about the approaches to that Longview Bridge, are they through industrial areas, or is in open country?

A Well, it has a pretty good approach. It is not bad at all. There is a town on the Longview side. There are paper mills down on the Columbia, but there is a place, a good place to come in around, and I wouldn't be concerned about the approach to the Longview Bridge.

Q Would the same thing apply, when I am talking about approach, I am speaking of both sides?

A Yes, the same on both sides. The south side of the approach is wide open. There is no trouble getting there.

Q What is the length of the bridge, the total length?

A I do not know. That is the only one I did not measure. I did not measure the Longview Bridge.

Q And this is a traffic bridge?

A It is a traffic toll bridge.



D. S. Goodbody,  
Cr. Ex. by Mr. McDonald.

- 748 -

Q A toll bridge?

A Yes.

Q I gather from you, you have been there and I have not, I gather from you that there are some industrial plants in the vicinity of each side of the bridge and the homes of people in the towns along there?

A No, wait a minute. There are the paper mills, they are on the north side of the bridge, the north side of the river west of the bridge.

Q Yes?

A There are two paper mills in there.

Q Yes?

A There are no industries on the other side of the river that I know of. There is a small town on the one side but there is ample room to get through on the south side.

Q What I had in mind was this, what provision have you made for complying with safety codes that are applicable to construction?

A In what way?

Q In congested areas?

A It is not congested. You are assuming it is congested.

Q Yes?

A And I am trying to tell you it is not congested in there.

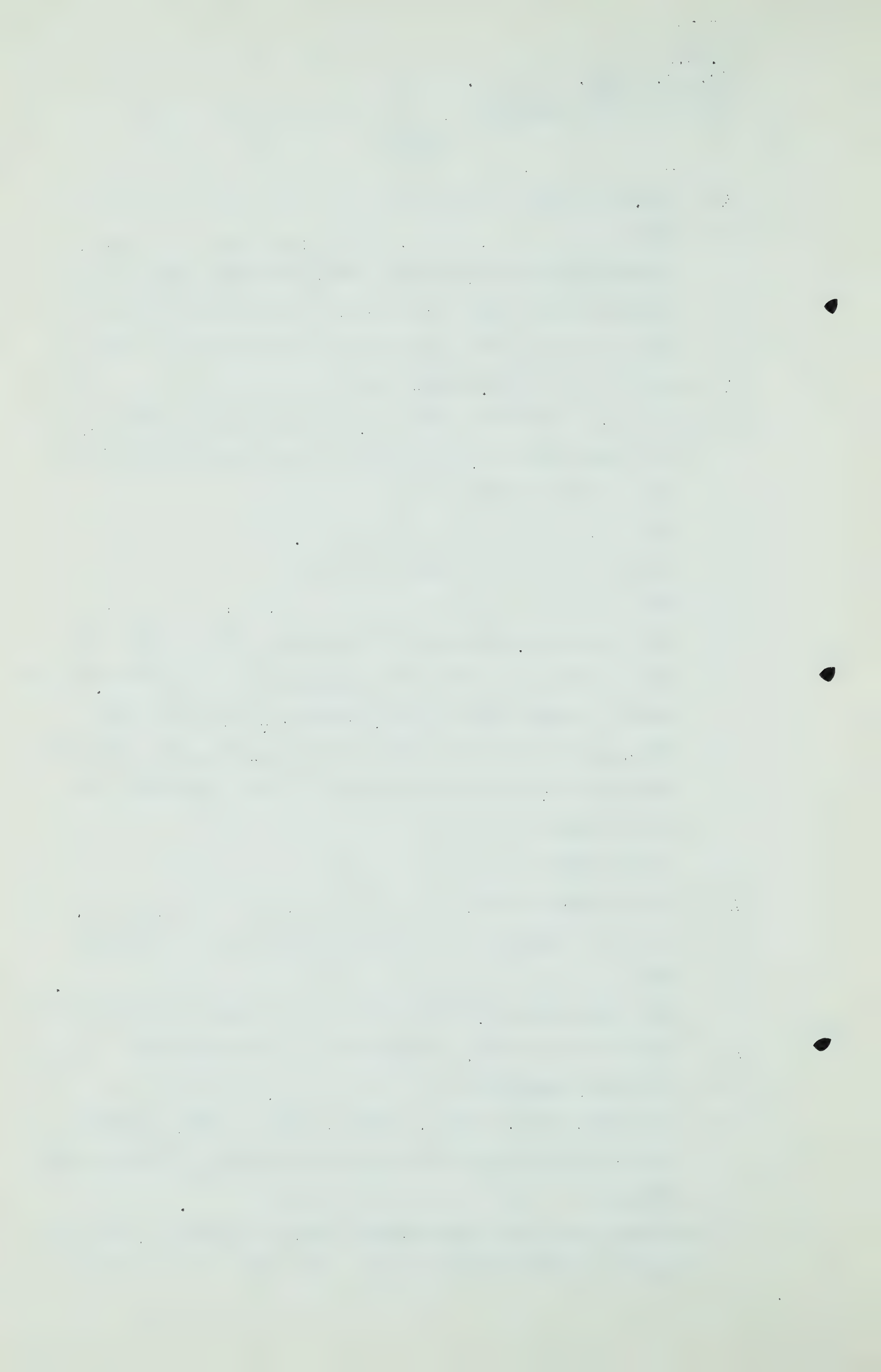
Q We will leave that. You say it is not congested?

A It is not congested.

Q All right, that is all I want to know. What standards did the Army engineers require in respect to crossing this bridge?

A The Army engineers have already given a permit. I do not believe it would enter into it. We would not be able to





D. S. Goodbody,  
Cr. Ex. by Mr. McDonald.

- 749 -

get below the present bridge.

Q The Army engineers have given you a permit?

A No. They have given the permit for the distance of the bridge.

Q But, I mean, for a gas pipe line?

A I do not think that would enter into it. It might, but I would not anticipate any difficulty in that place.

Q Mr. Goodbody, I was wondering, with regard to the line in Alberta, you mention you go through the Town of Coleman, and you go through Michel and Natal. Would you consider those congested areas?

A I consider getting through Michel a congested area, yes. As I said in my summary, getting through there, it is a bad spot, and if we can get around it with further surveys, we certainly will do that.

Q If you would have to go through there, what safety code would you have to comply with to go through Michel?

A I do not know what safety code we could have to comply with, but I am quite sure we would have to comply with it. I don't think that there would be any question about that.

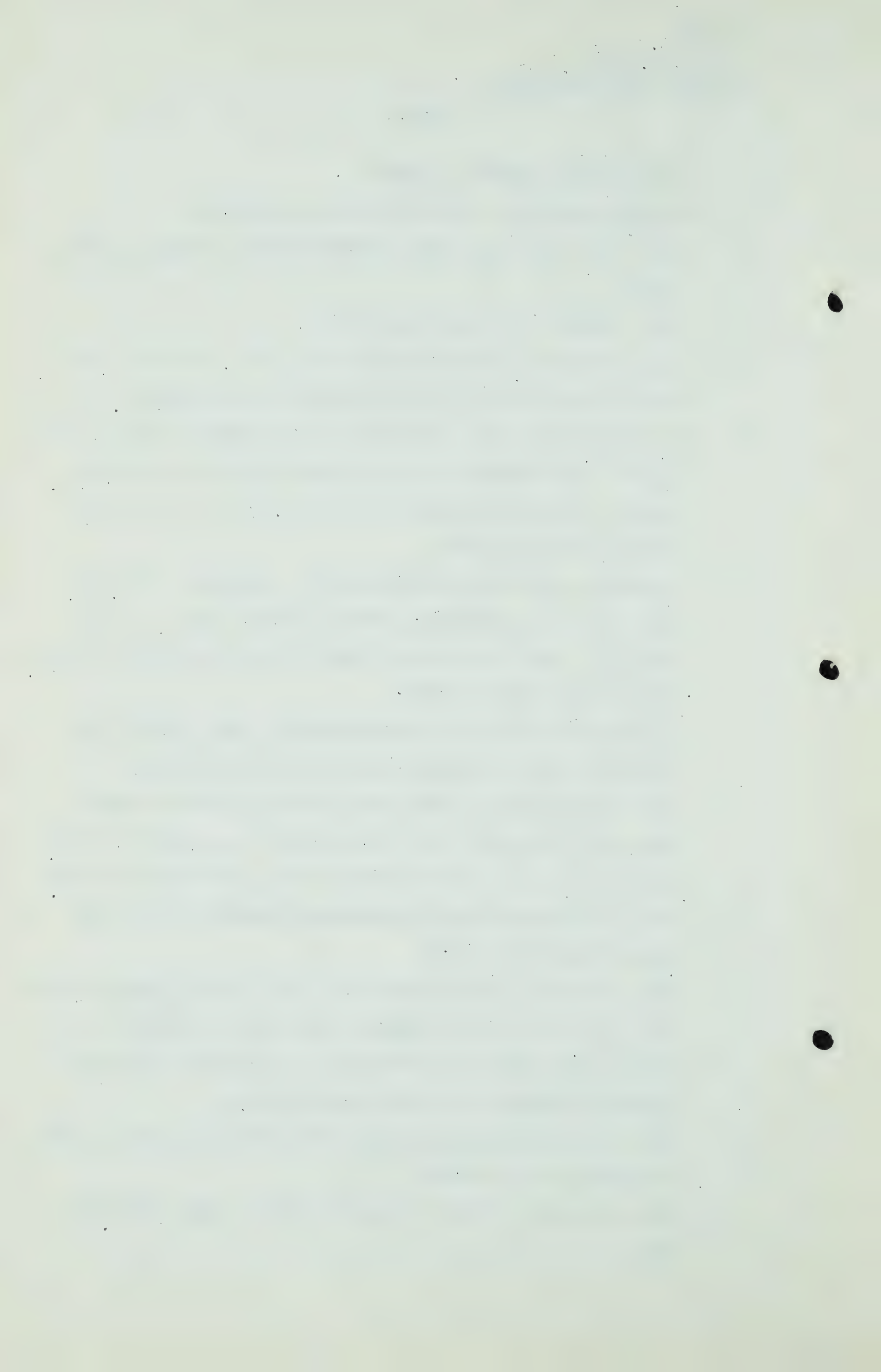
Q Are you familiar with the American Standard Association code for pressure pipe?

A No. I did not design this line, and I am not familiar with it, and it is a short distance that we would be in a congested area, and I do not think it is going to make any material difference in our over-all cost.

Q You are saying you do not know what the codes are, so that you really do not know?

A Well, we have said that we will stand by this estimate.

Q Yes?





D. S. Goodbody,  
Cr. Ex. by Mr. McDonald.

- 750 -

A And the amount that is in there, we have got a 10% contingency, so that we should be able to comply with anything.

Q I see. But in the set-up of your costs you have not provided for compliance with any code?

A No, there is nothing for any codes.

Q You are aware as to the requirements with regard to gas pipelines in Division 2 of the Code?

A No, I am not aware of that.

Q Now, before we leave this matter of costs, Mr. Goodbody, can you tell me this, have you ever given evidence before the Federal Power Commission in the United States?

A No.

Q You have not?

A No.

Q Have you ever given evidence before any other State regulatory body?

A No.

Q You have not?

A No.

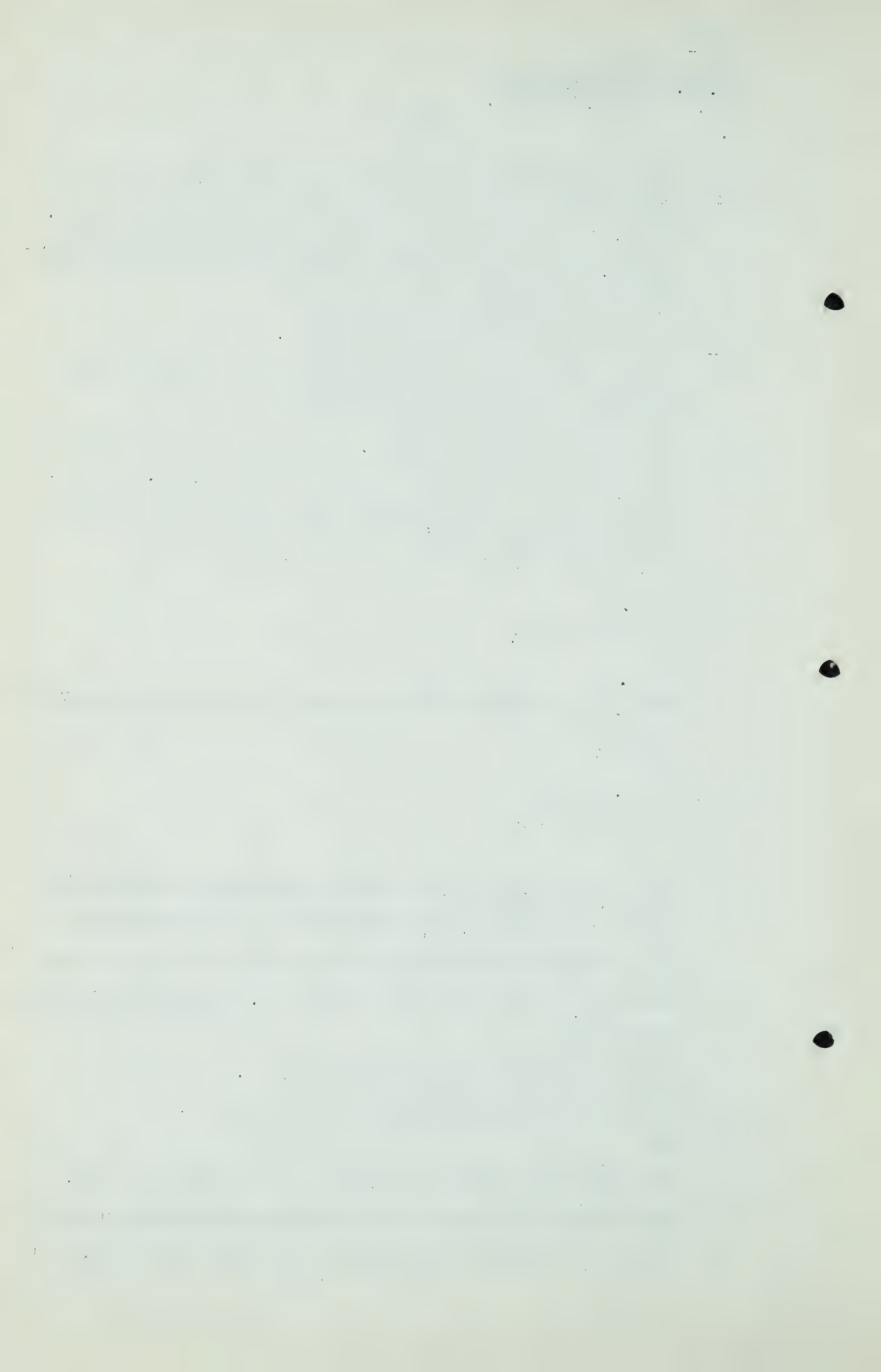
Q Now, I am informed if you were presenting this submission before the Federal Power Commission in the United States, that it would be required of you to give the detailed unit costs, as I have asked you to give. Do you know anything about that?

A I do not know anything about it, no.

Q You do not know anything about it at all?

A No.

Q Well, the only point I am making is, if that is so, and the Conservation Board of the Province of Alberta is asked to rule on a matter very vital to the people of Alberta,



D. S. Goodbody,  
Cr. Ex. by Mr. McDonald

- 751 -

on this information, and your client is going to have to submit information before a regulatory body in another State?

A Well, now, I think if I can straighten you out, I am not in any position to set up a policy of the people. We furnished the information we were requested to furnish, and we think that we have complied with the requests of the Board.

Q You think you have?

A Yes.

Q Do you think you have complied with this statement in your report? Let us look at it?

A What page?

Q On Page 3 of your Exhibit 15 you state here, " The lower capital investment and operating expense will result in an economically feasible transportation cost to the North Pacific Coast and consequently Alberta producers will receive the best possible price for their natural gas." And then in a number of other items you point out this is the lowest and the cheapest?

A Yes.

Q Now, do you think, for instance, on Page 2, you say "the one outlined here was found to be the cheapest to construct and the most economical to maintain." Now, do you think you have given me sufficient evidence in what you have now said, so that I can report to my client that on your evidence I feel that this is the cheapest line?

A I think so. I think there is enough in this detail right here, and your client can get the line built down there just like anyone else for the same price, I will say that.

Q Yes.





D. S. Goodbody,  
Cr. Ex. by Mr. McDonald.

- 752 -

A Now, you can report that to your clients, Mr. McDonald, if that is what you had in mind.

Q What you mean to infer is that your firm will take the contract and do the job for this price?

A We are contractors.

MR. C. E. SMITH: And they like to get business, I suppose.

A Yes, they do.

Q MR. McDONALD: Now, let us go to another matter, Mr. Goodbody. We will just deal very briefly with this Allison Pass area, or the Hope to Princeton area, and what I want you to tell me, I presume you have the information in your notes, as to where the slide areas to which you refer are, and the approximate width of each?

A No. In my opinion, as I have said yesterday, there is a long area of ground where these gravel deposits and glacial deposits are, and it is evident that some movement is taking place in a great many of them, and I did not measure each one of those places, but it is over a long area that these things might occur.

Q Now, what do you mean by a long area?

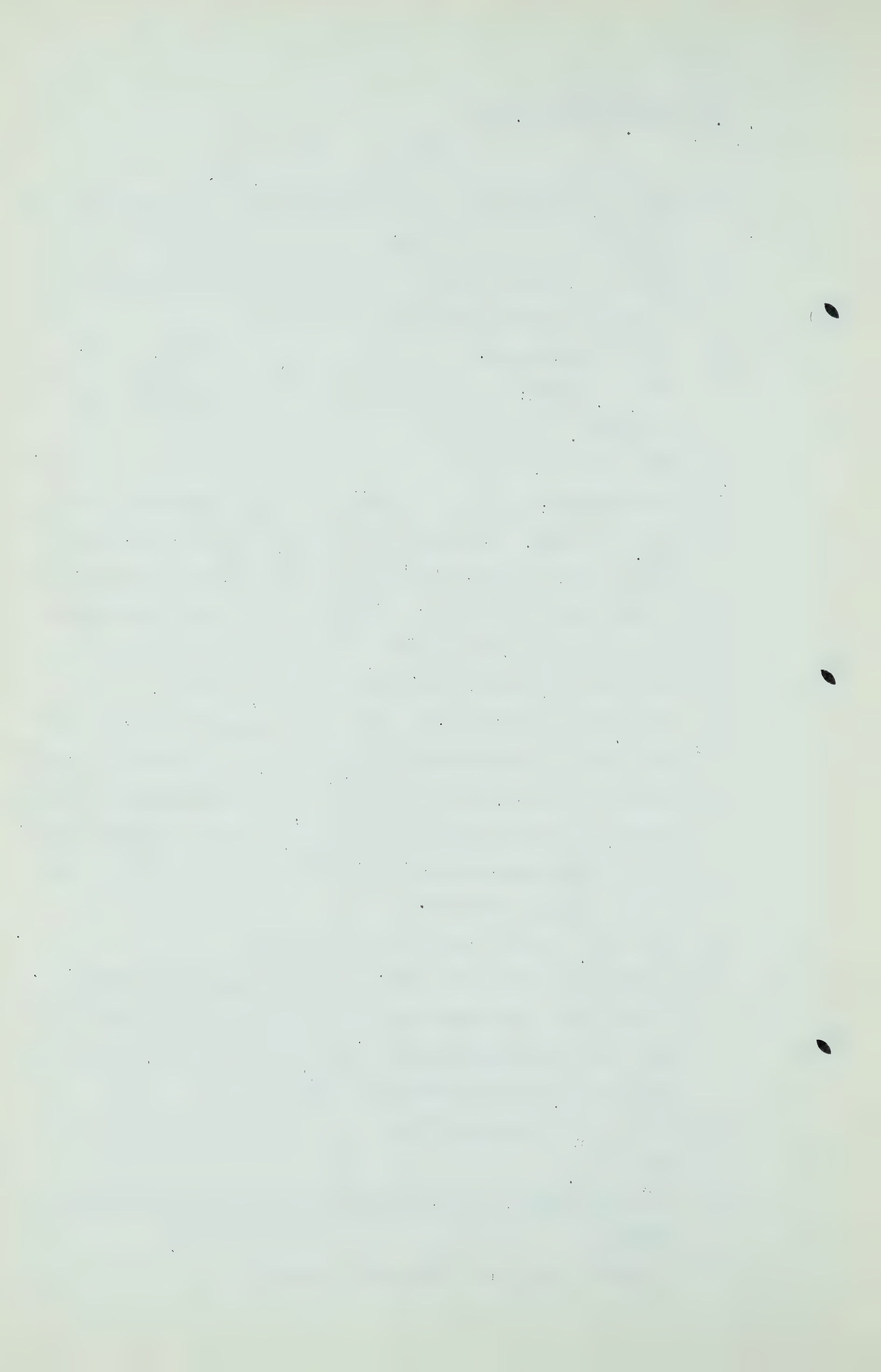
A I said about 20 miles. Please do not misunderstand me. I do not mean the whole thing is coming down in a pile. I mean there are short areas from 50 feet to about 200 or 300 feet, and we do not enumerate them at all.

Q You do not enumerate them?

A No.

Q In other words, you have what you might call a horseback figure?

A I wouldn't call it a horseback figure.





D. S. Goodbody,  
Cr. Ex. by Mr. McDonald.

- 753 -

Q Tell us how many....

MR. NOLAN: Just let him answer the question,  
Mr. McDonald. If you would not interrupt the witness  
constantly you would get an answer.

Q MR. McDONALD: All right, go ahead?

A We have classified the ground. As I told you, we have  
classified the ground, and a lot of the area that might  
appear as slides might be classified as gravel ground in  
our classification.

Q Now, did you prepare field notes in regard to this area?

A Surely.

Q Have you prepared field notes in regard to all of Route B?

A Yes.

Q Now, would you be good enough to provide those to the Board  
as an exhibit, so that I may examine them?

A I do not happen to be in a position to do that. It is  
like anyone else's field notes, they are in notebooks, and  
pencilled sketches, and they are not in any condition to  
be provided for anyone.

MR. McDONALD: Mr. Chairman, I am in this position  
that I have no idea what large areas mean, what extensive  
slides are. This man has all the detail of that that I am  
trying to get.

MR. NOLAN: Mr. Chairman, if I can help my  
friend, we are going to call a witness as soon as Mr.  
Goodbody leaves the stand. He has made a detailed survey  
and he will go over the Allison route foot by foot, and we  
will give my friend all the detailed information that  
can possibly be obtained.

MR. McDONALD: Let us just forget about Hope to



D. S. Goodbody,  
Cr. Ex. by Mr. McDonald

- 754 -

Princeton, let us deal with Route B as a whole. I am asking the Board to have this witness provide me with his field notes from Pincher Station to Vancouver and Portland. He has them. They were filed on the application of my learned friend in another matter.

MR. GOODBODY: My field notes were not filed.

MR. McDONALD: No, not yours, but my learned friend insisted that they be put in in another matter, and the Board so ruled, and I ask that the field notes be filed with regard to this matter of route and classification.

MR. NOLAN: My memory is that the witness has them and will testify from them.

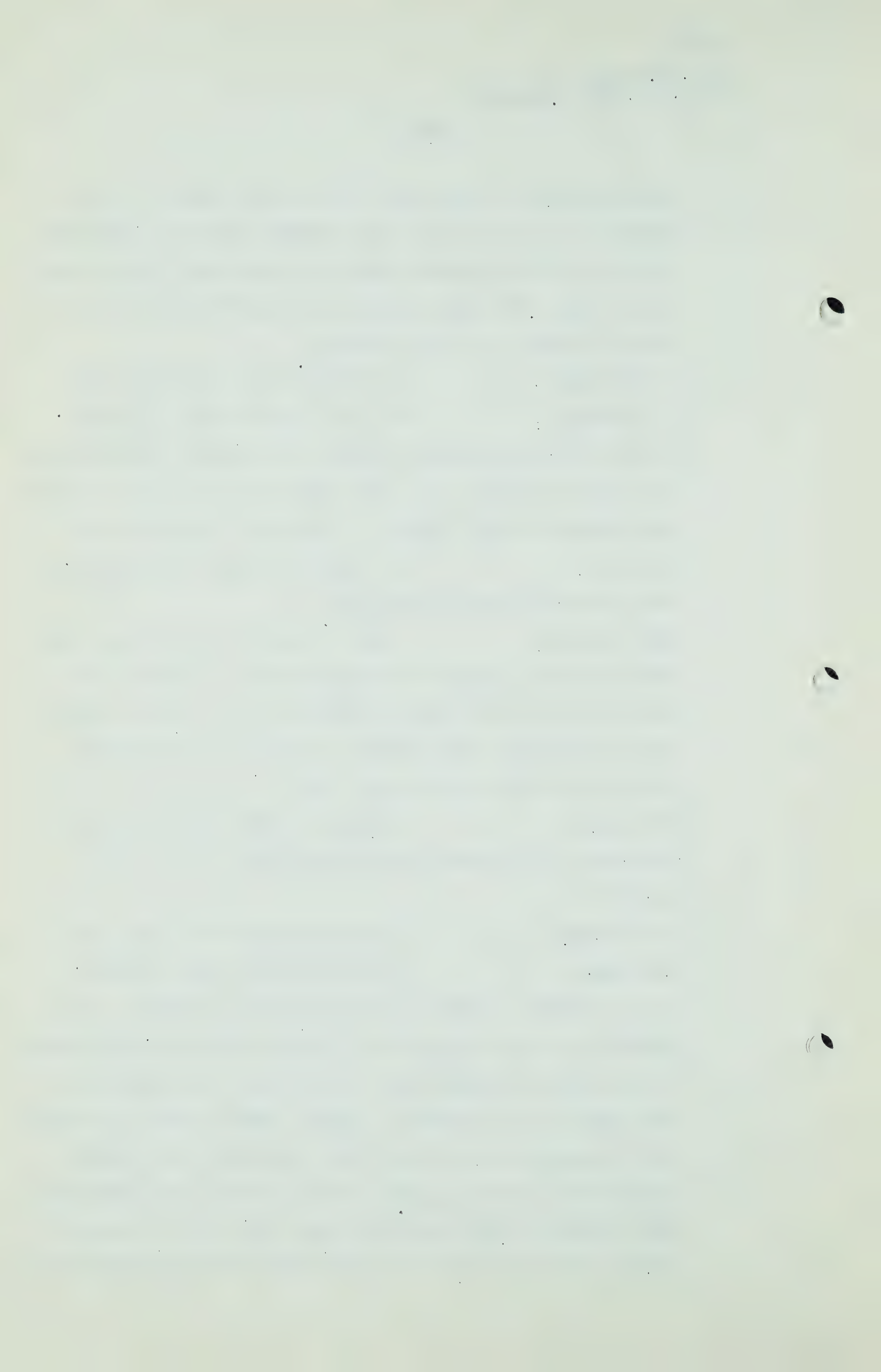
THE CHAIRMAN: That is correct, but I think the witness should provide the field notes. I think if we have field notes in one case and if we are going to make a proper comparison with respect to them, we should have more details than we have got now.

MR. NOLAN: Perhaps we could meet the Board's requirement by getting them and providing them to the Board?

MR. McDONALD: We would like to see them also.

MR. NOLAN: The purpose of this inquiry is not to satisfy the Westcoast Transmission Company. The purpose of this inquiry is to provide sufficient information to the Board in order that it may reach a conclusion on the question of whether an export permit should or should not be granted, and we are doing our best to meet those requirements as we go along. These notes, as I understand the witness to say, are very rough, they are on pieces of paper, pencil sketches, they were made on the ground as they





D. S. Goodbody,  
Cr. Ex. by Mr. McDonald.

- 755 -

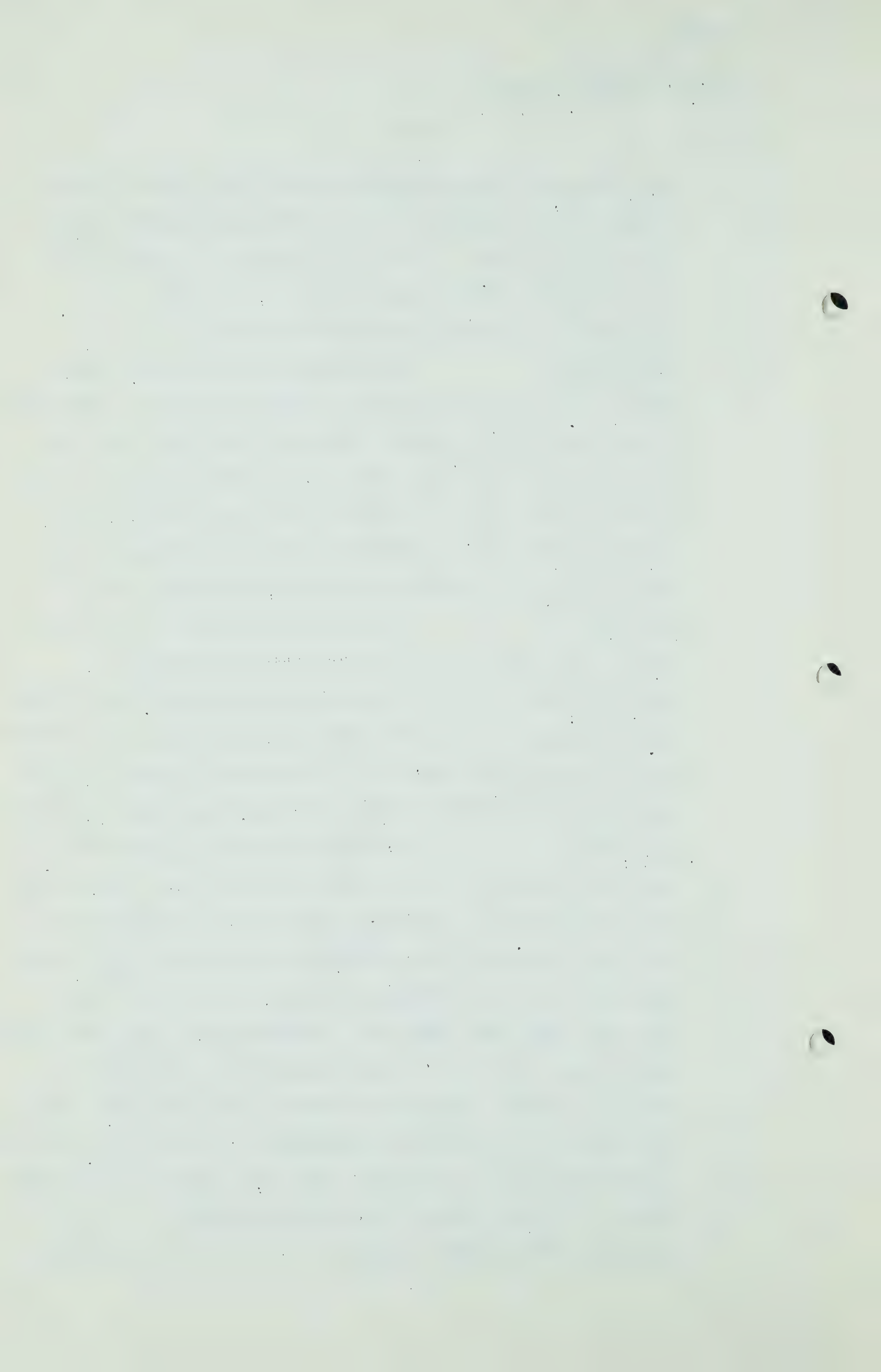
went along, and then from those notes they compiled these statements and estimates of costs which are produced and placed before you. It is, of course, as you know, sir, an independent company employed by us to do this work, and this is the manner in which they have done it.

THE CHAIRMAN: We should have sufficient information, Mr. Nolan, so that we can make an accurate comparison of the costs of the various routes. I do think that the matter of unit costs and details in regard to specific parts of the routes, which, to say the least, are contentious, or where there may be additional costs, that we should be able to get those details to be able to examine them.

MR. NOLAN: If you are thinking of the Allison Pass, I can supply them through this other witness.

THE CHAIRMAN: There will be not only Allison Pass, as Mr. McDonald has stated, there might be other parts of the route in which the counsel, or in which Mr. McDonald claims there will be excessive costs, and amendments should be made.

MR. NOLAN: Perhaps it would be sufficient if they were provided to the Board. I am not very sympathetic with my friend, Mr. McDonald, because his horseback figure, if I may compliment it by calling it that, is a figure which they made up from a distance of 8 to 10 miles from where the route might some day be. So that really the field notes that we made or that were made under those circumstances, would not be very valuable to anybody, including the Board. I am anxious to do what I am required to do, and I am anxious to meet the Board in any way I can, but I would not like the Board to be swayed in any way by the requirements of the Westcoast Transmission Company, with whose request I have





D.S. Goodbody,  
Cr. Ex. by Mr. McDonald.

- 756 -

no sympathy whatsoever.

THE CHAIRMAN: We feel, Mr. Nolan, that we should be in a position to compare the costs of various routes. I do think that we should be supplied with further details of the costs than we have at the present time.

MR. NOLAN: Well, if it could be indicated what is required, then perhaps we could.

MR. GOODBODY: Whatever you say.

THE CHAIRMAN: Could we, for instance, get the classification of the various sections that you have here, showing the different classifications which you have based your unit cost on, that is, clearing, excavation and backfill? I see you have got those all together in various places. Could you break those down?

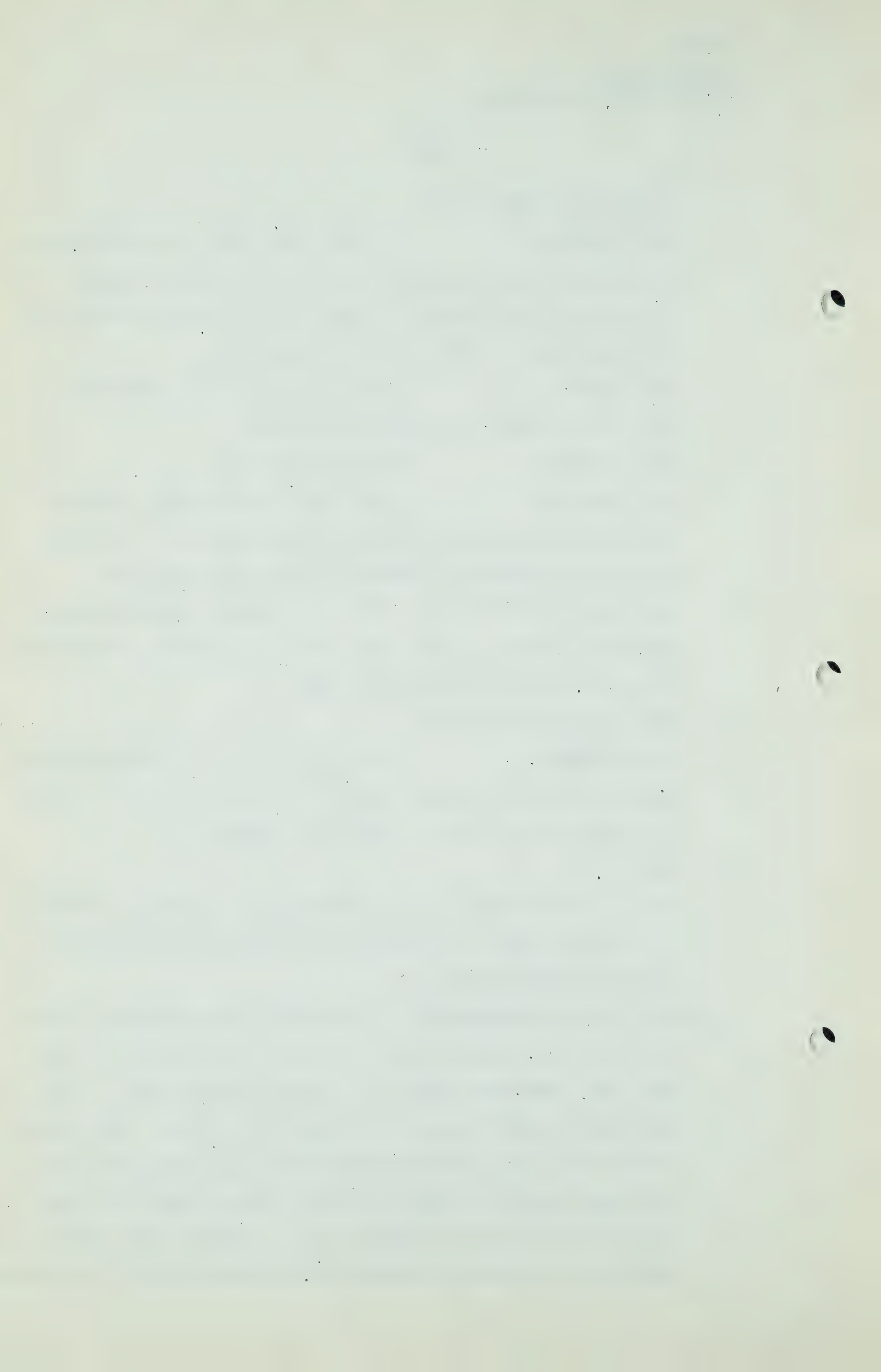
A The quantities of each?

Q THE CHAIRMAN: Into those various classifications, and then give us the unit costs of those, so that we could get some idea how those totals are arrived at?

A Yes.

Q And so that if there is any particular contentious section of the line that we would know into what classification we are to split it up.

A Well, on the instructions of the people that hired us to do the work, whatever they say, on your instructions to them, why, well, whatever they say we will take care of. I do not like to make our unit costs public. We have used them, and as far as the Board is concerned, why, I am sure that my people would not mind the Board having them, but as far as the unit costs for publication, or handing them out, I am quite sure that my Company would rather not do it that way.



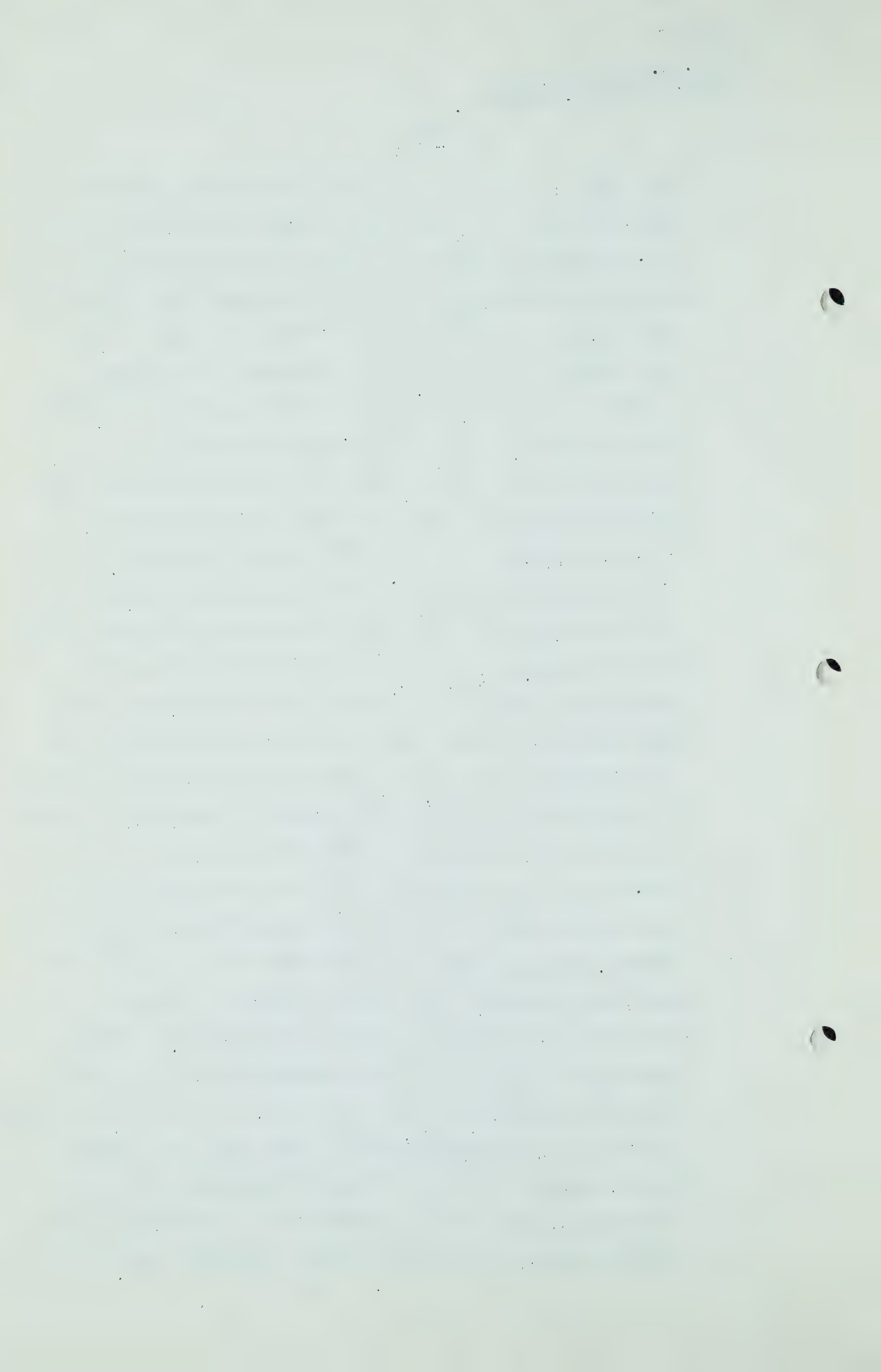
D. S. Goodbody,  
Cr. Ex. by Mr. McDonald.

- 757 -

MR. MOLAN:                                You will, of course, appreciate, sir, that this is a very highly competitive business that Mr. Goodbody is engaged in, and their life is spent in making bids on various contracts, which they may or may not take up, and the basis of those bids are the unit costs which they utilize, and, as I understand the witness, it is more or less a trade secret, something which they keep unto themselves. But, I understand the witness to say that they would be quite content to provide the Board with everything they have for the Board's own information.

MR. S. B. SMITH:                        Mr. Chairman and Gentlemen: I am not a party to the particular dispute that is going on at the moment, but I am interested in the course which this inquiry is taking. And, sir, as you will recall, some months ago I drew to the attention of the Board the fact that under the Statute there is a condition precedent to the granting of any permit, which is, that a permit cannot be granted unless gas in the opinion of the Board is surplus to the present and future needs of the people of the Province. I then suggested that this Board hear evidence upon and determine the question of what the gas reserves of Alberta were, and what the present and future needs of the people were, whether there was an exportable surplus. I received at that time no support from any of the counsel representing any of the other interests here, as I recall, and so the consequence is, sirs, we go on, and we are getting, or going into the application of each individual company from the start, and we go on with gas reserves and deliverability, and then we go into markets over tremendous areas, and we get into the pipeline routes, pipeline costs, and





D. S. Goodbody,  
Cr.Ex.by Mr. McDonald.

- 758 -

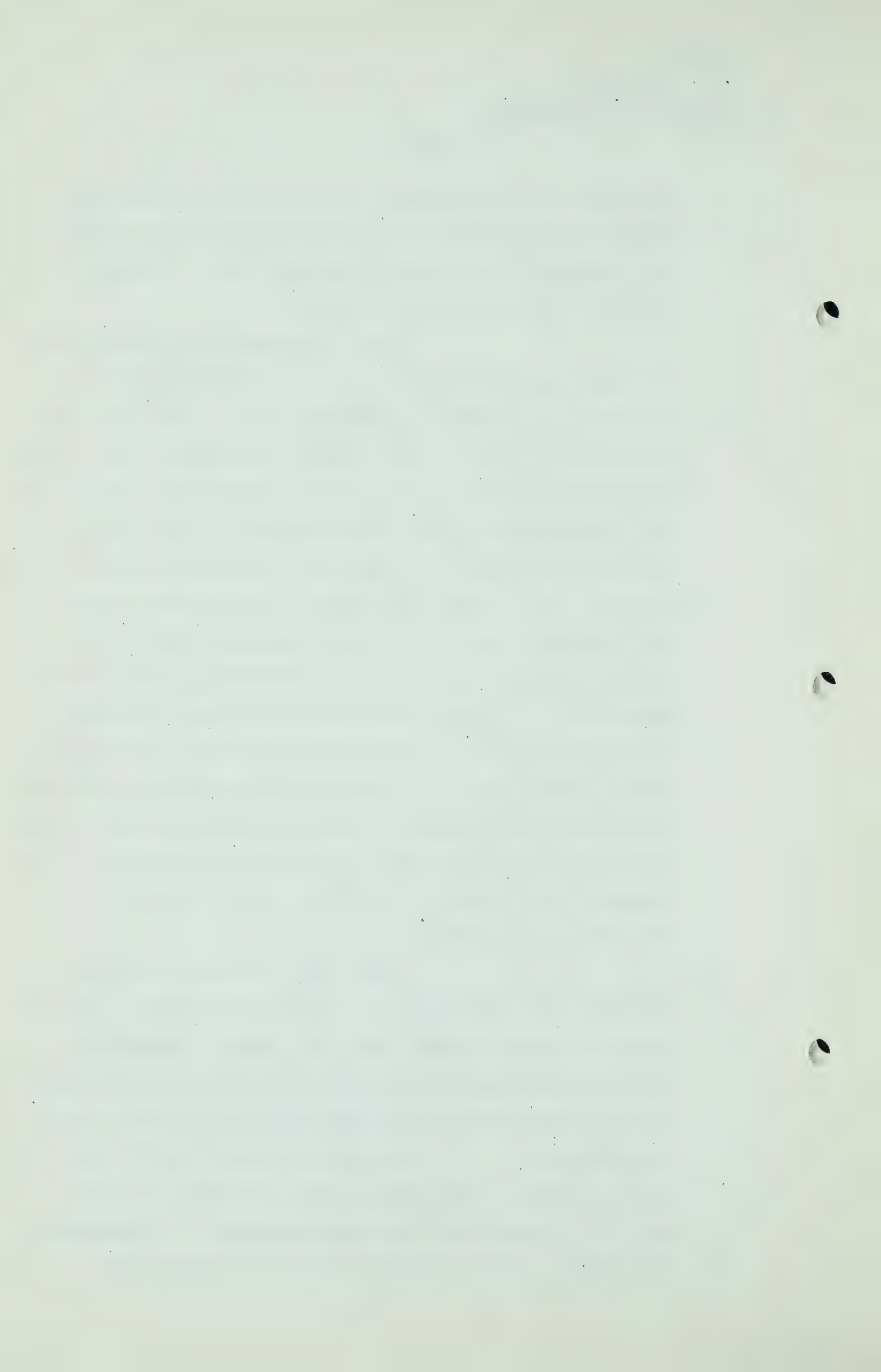
all these various subjects, and now we are getting down to the detailed field notes, and I am not concerned with the particular field notes, I may say, but I am only concerned with the general question.

What I am suggesting to you, sirs, is if this inquiry continues, and I am endeavouring to be constructive in what I am advancing to you, sirs, but what I am suggesting is, if this inquiry continues on the course which it is taking, we may be here several years hence, and the exportability of gas, which appears to some people as a matter of considerable importance to the people of Alberta, primarily, and to some other people with whom we are not so much concerned as we are with the people of Alberta, but if we are going to go into the field notes of every expert witness who is called here in relation to all this great variety of subjects, which may or may not require consideration, because there has been no decision upon the condition precedent to the granting of an export permit, it may consume a great deal of time, with possible loss, I suggest, to the people of the Province of Alberta. It is impossible to tell that at this stage.

Now, sirs, I do not know what remedies there are, and it is difficult to make a concrete suggestion at this stage, but I do suggest respectfully that it is something that requires most serious consideration by this Board, and by everybody engaged upon this Inquiry.

MR.McDONALD:

Mr.Chairman, all I have to say about Mr.Smith's statement is that the matter of route may have a great deal to do with the matter of determining the surplus of gas and what is available for export.



D.S. Goodbody,  
Cr. Ex. by Mr. McDonald.

- 759 -

MR. NOLAN: That is certainly a change of attitude, because I can remember being in this building during the Westcoast application when counsel for the Westcoast said, "Mr. Chairman, I do not think the Board is too much concerned with the matter of route," and that will be found in the transcript of the Westcoast Transmission application.

MR. McDONALD: I have changed my mind. There is one further thought, Mr. Chairman, on which I should like to direct your attention. I would like Mr. Nolan to say now if this witness is being called by the applicant as an engineer, and as an expert by them, or is this a contractor bidding for or has entered into a contract to build this line? Now, I would like to know with regard to that.

MR. S. B. SMITH: If I may interrupt for just one moment. I was thinking perhaps I had no business to be on my feet during this argument. As I say, I am only endeavouring to advance constructive suggestions, or something that may lead to a constructive suggestion. I am wondering whether counsel for the Board has any suggestions to offer or contributions to make?

MR. C. E. SMITH: I have when you are all through.

(Go to page 760)



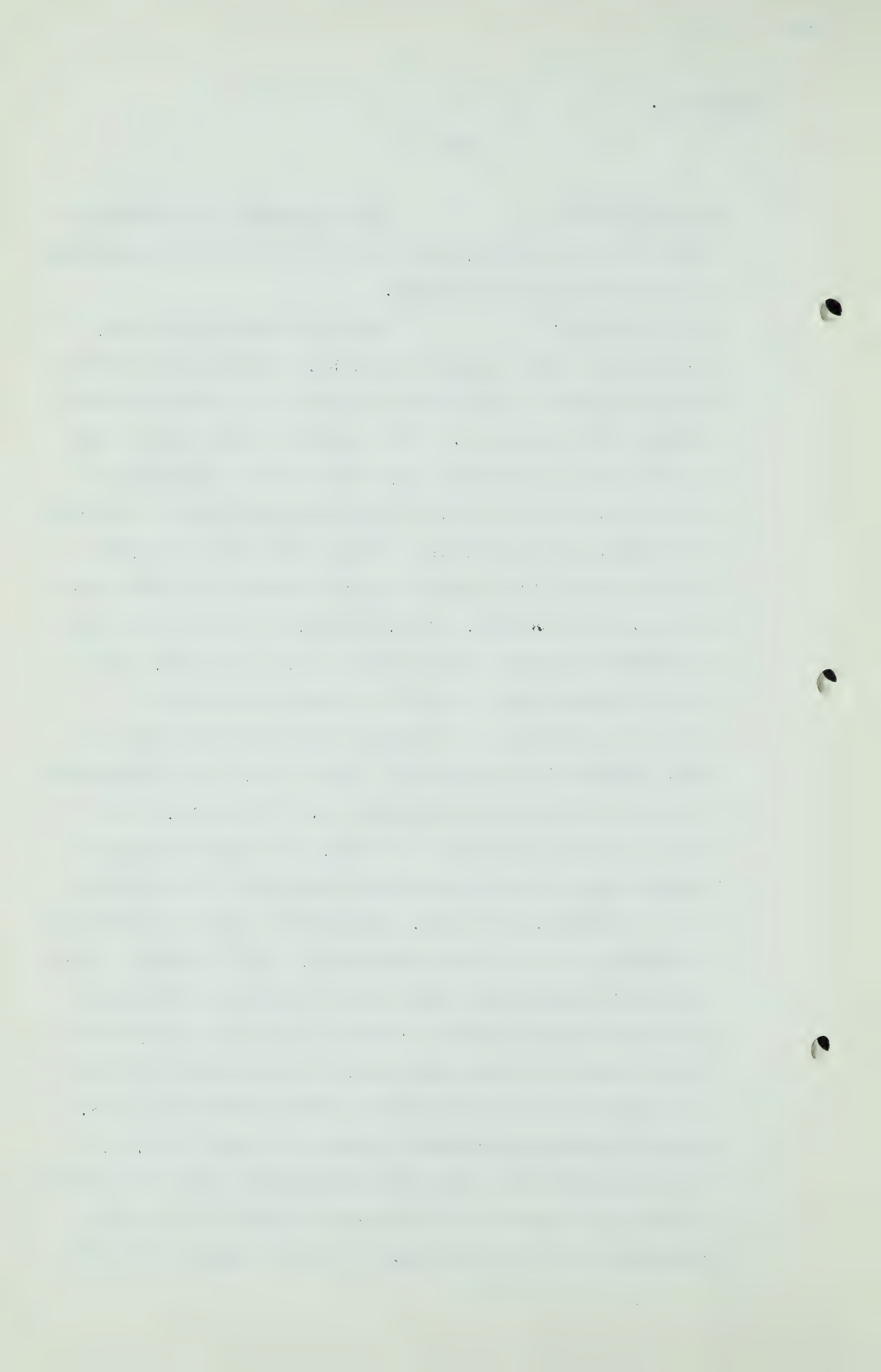


Discussion.

- 760 -

MR. S.B. SMITH: At the moment I am getting no opposition from anybody, and I am not a party to the argument by the parties on my extremes.

MR. C.E. SMITH: Well, if they are through, Mr. Chairman, may I suggest this, Mr. Goodbody is a witness and he has made a submission and part of it includes detail and part of it does not. With respect to those parts that do not include detail but only end up with a lump figure at the end, I am inclined to think any person who is entitled to be here, as Mr. McDonald or any of the rest of us, are entitled to get the information from which those tables are made up. For instance, if \$2,028,000.00 is made up of this and that and so much of something else, I do think, and I am not taking sides, I think any examining counsel is entitled to have the information from which that total is made, whether it be the actual field notes, and I understand it may be in various books and so on. I think Mr. Nolan would be quite agreeable to do this, to prepare some submission with at least more detail than there is in Exhibit 15, for instance, giving Mr. McDonald at least an opportunity of finding out how totals are made up. At the moment I agree with him in many cases there is no information along that line and the best answer he can get, and I do not say there is anything untruthful about that, "We companies all being in a competitive business do not like to make that public." Maybe you would be agreeable to give it to the Board. I would suggest to the Board that they do not receive something unless they receive it in evidence, as was agreed at the beginning of all this Hearing. I do not suggest if it is



## Discussion.

- 761 -

refused anybody should be committed for contempt by a judge. I suggest for the benefit of both Mr. Nolan and Mr. McDonald it would assist the Board if we have to go back into costs, and they would be able to digest Exhibit 15 if they had some more detailed information with regard to some of these matters at least. That is purely a suggestion.

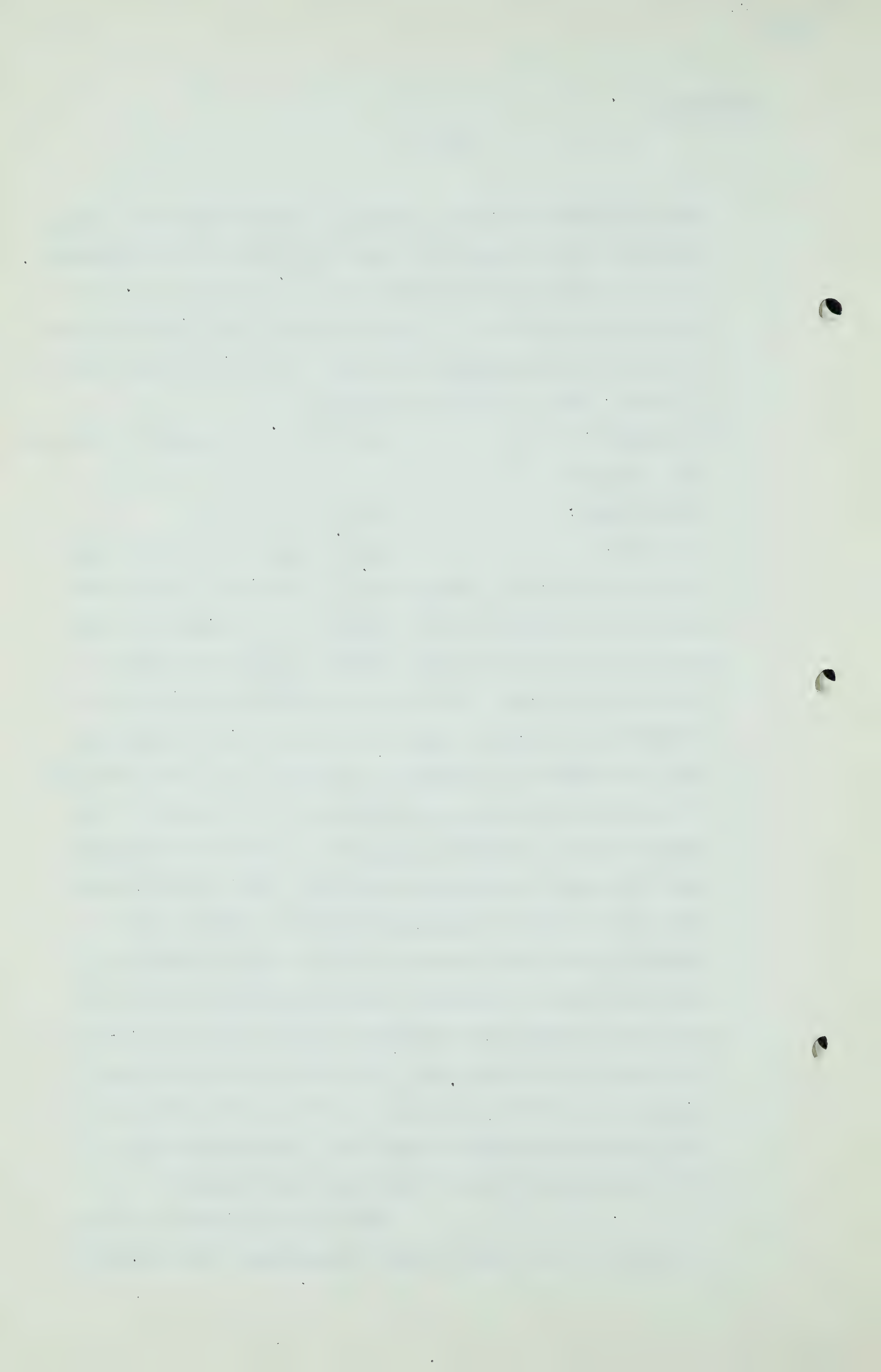
MR. BROKAW:                    Could I consult with the witness  
for a moment?

THE CHAIRMAN: Yes.

MR. NOLAN: Mr. Chairman, the reason that we have to speak to the witness is quite obvious. We have to know what the policy of his company is in respect to these matters because he is only a servant engaged and paid by us to do a job of work. It is not our material, it is not our information, we have not got it, and in order to make any public statement as to what is to be done with it, it follows of course that we must get some idea of the wishes of the company itself. We have discussed it with Mr. Goodbody and only took about 30 seconds to arrive at the conclusion that the company, with our permission and our request, will present to the Board details of how all these figures are made up by way of a separate submission which will be prepared and presented to the Board, and of course made public as evidence at this Hearing. That can not be done in a moment, as you well know, sir, but it will be done and I am sure that the information which will be provided will be quite satisfactory both to the Board and counsel.

One difficulty which arises, of course, is that this is very voluminous, this material,





Discussion.

- 762 -

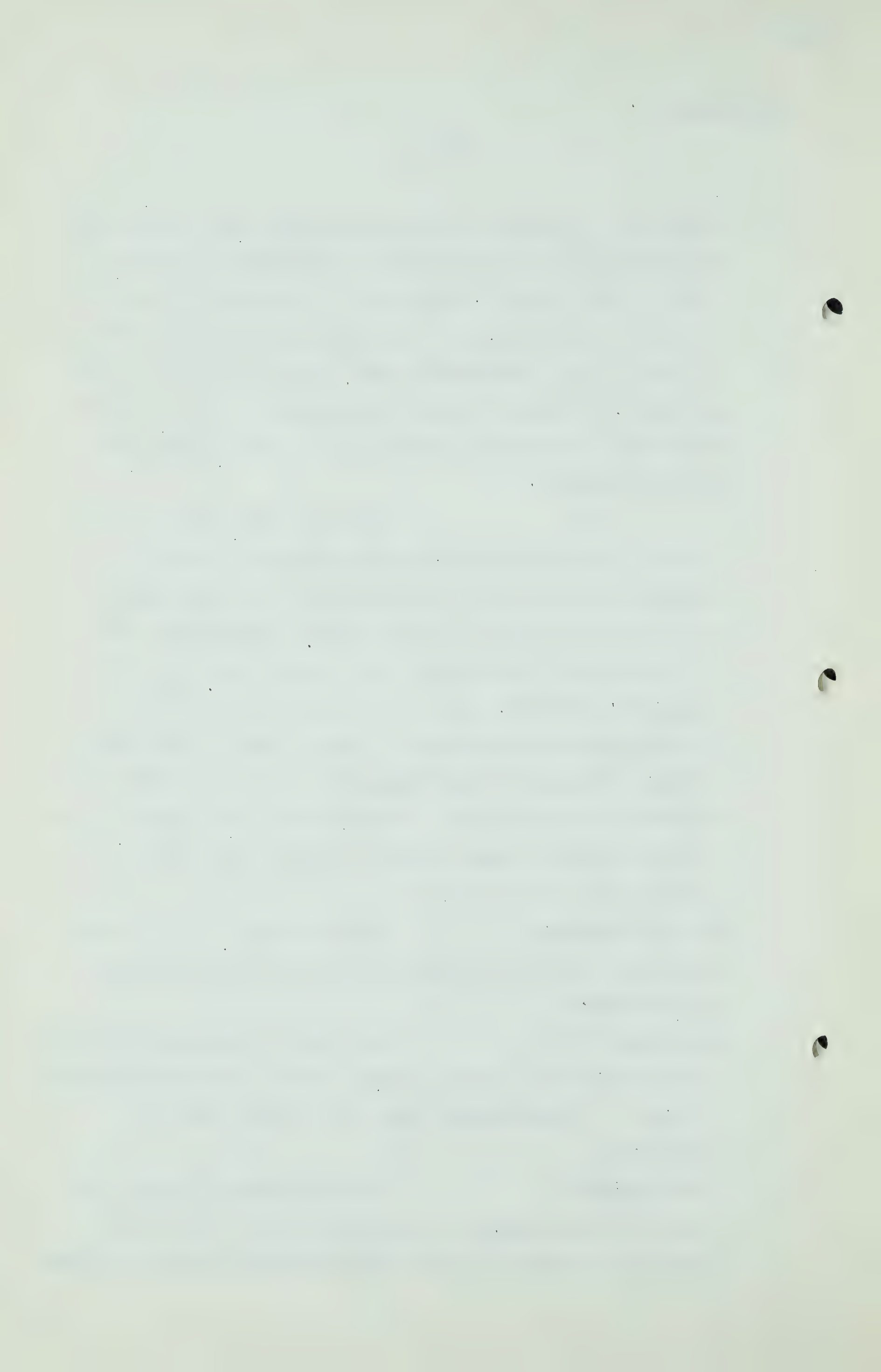
because as I understand it there are many, many, many field notes taken by these surveyors or engineers who go over a route of this length. Now, there is a practical question connected with that, as to the copies that are to be made of these things for distribution. We would not like to be put under too great a burden with respect of that, and we would like the Board to limit it, if it will, please, as much as possible.

We think, sir, that so far as the field notes are concerned they should be placed in evidence, shall we say, and be available for examination for anyone who wishes to look at them. To copy all that and distribute it would be a very onerous task. All my friend, Mr. McDonald, wants is to have an opportunity for his advisors and assistants to look at them and see what is in them. They can be made available at the Board office or wherever it is convenient to the Board and Mr. McDonald, but I think he will perhaps excuse me from the necessity of copying that sort of thing.

MR. D.P. McDONALD: That is quite so. If I want any copies I will have them copied at the Board's office at our expense.

MR. NOLAN: And then the detailed breakdown of the estimates, as it is called, we will prepare some copies of that. I think perhaps five or six copies will be sufficient.

THE CHAIRMAN: I do not think it needs to be done in too much detail. I felt possibly if you had the details or breakdown in the classifications for those various



Discussion.

- 763 -

sections that are mentioned here in the report and then give some idea of the unit costs, and that should be sufficient.

Q MR. NOLAN: That is not too clear now. Is it clear to you, Mr. Goodbody?

A THE WITNESS: Just take for instance between any one of these sections that I have listed, like Keremeos to Princeton, if I have the amounts of each classification in there, that is what you want? Then if we set it all up on a unit price basis, on an overall picture like we have here, only with more breakdown.

THE CHAIRMAN: So that if we have the detailed information by sections, or the amount of clearing, excavation and backfill, if that could be separated, then you have your classifications for the different sections and the unit price for each. Is that sufficient, Mr. McDonald?

MR. McDONALD: Yes, that is what I had in mind, that he would take the sections he had in his picture, for instance, Pincher Creek to Bellevue, and would classify it in slightly rolling, rolling, rock.

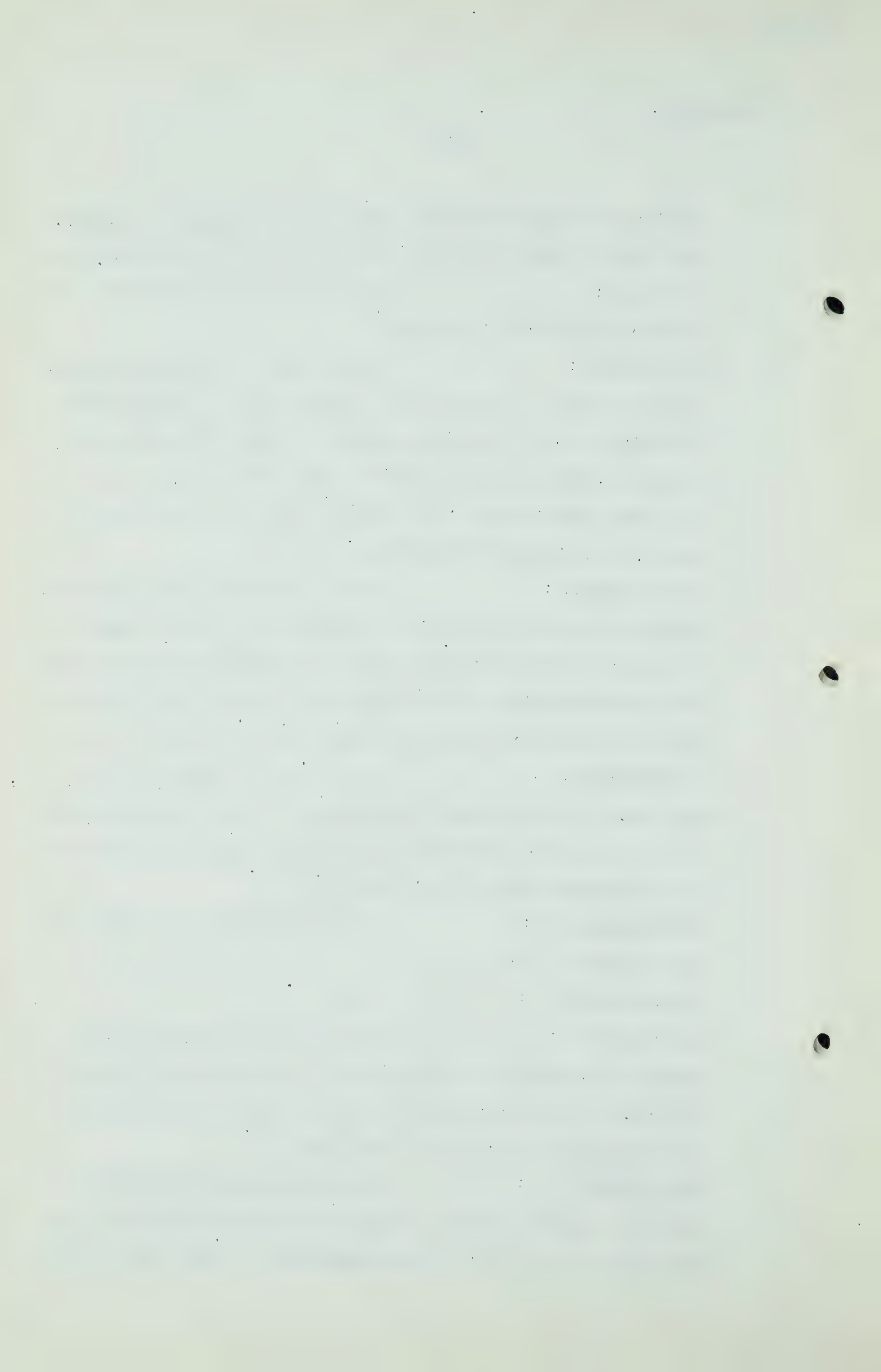
THE CHAIRMAN: I know that would be sufficient for the Board.

MR. McDONALD: Yes.

MR. NOLAN: As long as everybody understands. I am not too sure of what is required but I think Mr. Goodbody is, and there are certain sections that are to be broken down, sections of the line.

THE WITNESS: My notes include that and I think it is pretty close to this as it is written and I can take care of it, if it is satisfactory. I think that I have





Discussion.

- 764 -

it in the proper form the way I set it and everything ties together in all my working papers.

THE CHAIRMAN: We suggest that he follow the same order as they are in the submissions, Pincher Station to Bellevue and so on.

Q MR. NOLAN: I am just wondering whether or not the field notes would be the thing and the only thing required?

A They are not clear enough. Anyone who has taken field notes and written them in an automobile, they would not be. There are a lot of things.

Q Well then, we would require your office working papers?

A If we have my working papers and bring out more detail I think we can give them everything Mr. McDonald wants.

Q Are they called the office working papers?

A Yes.

Q Well then, if we provide that to the Board then Mr. McDonald may examine it. I wonder whether there would be anything else required. They tell the whole story, don't they?

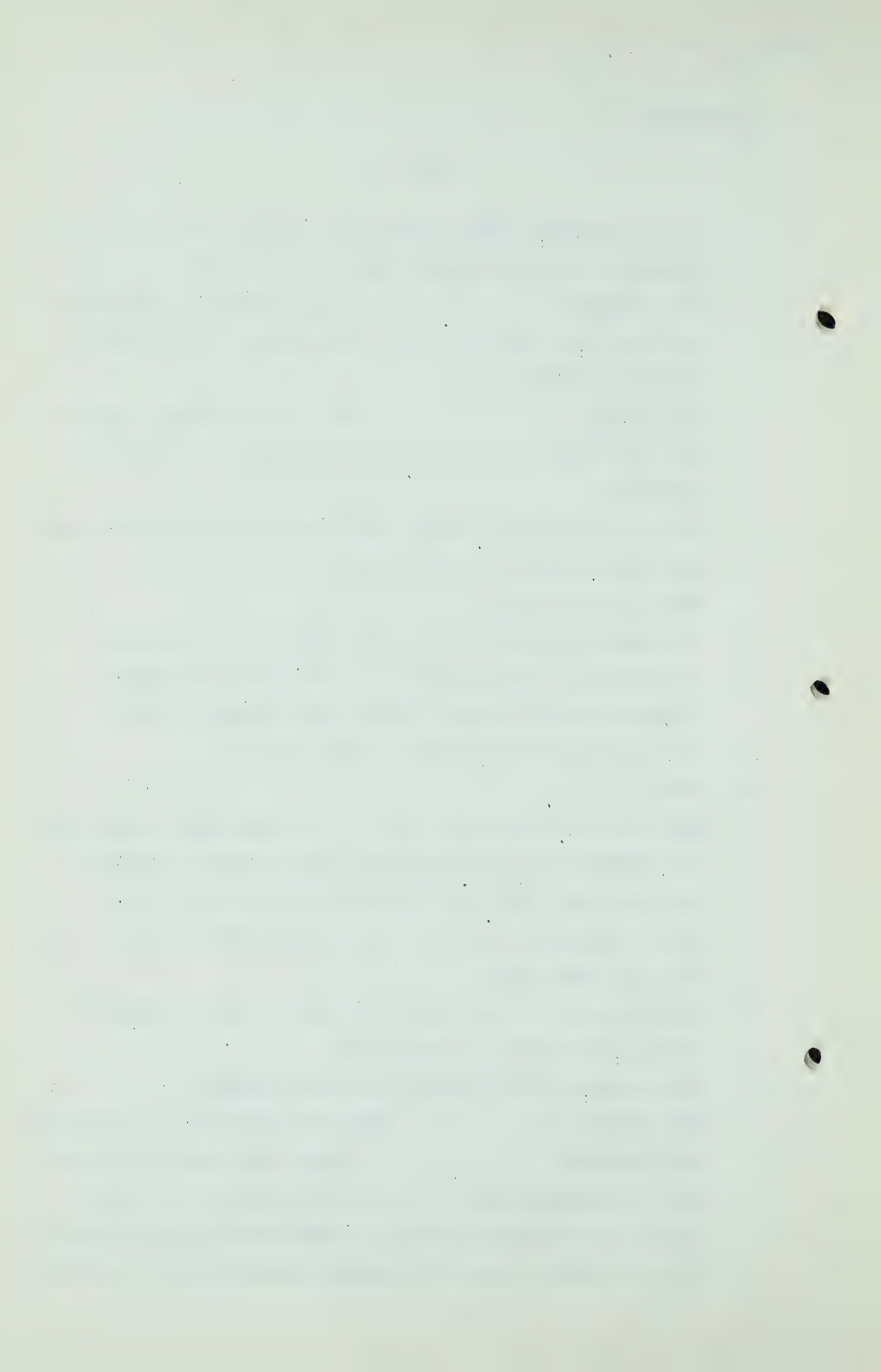
A Well, practically, yes. We have the pencilled copies. They tell the whole story.

Q And what we put in as Exhibits 14 and 15 merely summarize those office working tabulations?

A They summarize the work we did in the office.

MR. NOLAN: What do you think, Mr. Chairman?

THE CHAIRMAN: I think, Mr. Nolan, if you can get the working papers with such information that would enable us to take any section of that line and if we want to find out what the cost of clearing, excavation and backfill



Discussion.

- 765 -

was for any section of the line we could find it.

THE WITNESS: Yes, we can do that. We can furnish them.

MR. NOLAN: We are all understanding one another now.

MR. C.E. SMITH: Before Mr. McDonald takes over, Mr. Bruce Smith took the opportunity of making another suggestion to this Board, so that there will be clarity about his suggestion, if I understand it correctly, he now suggests, as I think he suggested before, that the Board, if I understand it correctly, postpone everything by way of evidence except that which relates directly to reserves and to the Board's duty under the Act with respect to the protection of Alberta residents. Might I be permitted to ask Mr. Smith if that is what his suggestion is?

MR. S.B. SMITH: I think that is briefly it, sir. I took the position in detail, and it is in the transcript, at some length about three months ago, and I suggested it then and I suggest it now, that there is a condition precedent to be decided by this Board before there can be any export permit to anyone, and that the logical method of proceeding I then suggested, and I am suggesting now, is to have evidence led relating to that question and that question decided one way or the other before these collateral questions are gone into, else we may be here for years; these markets they talk about, somebody else may take those markets if we stay here long enough.

MR. NOLAN: I think I should add here, sir, because we put in a lot of work and effort in the preparation





Discussion.

- 766 -

of this application, I would not like to think that the Prairie would be excused any of the efforts we have made.

MR. S.B. SMITH: I should say we are getting well educated by my friends, Westcoast and Northwest. They are blazing the trail and we expect to follow right along.

MR. NOLAN: And over the same road.

MR. S.B. SMITH: We have not let you in on the secret yet.

MR. C.E. SMITH: If that be Mr. Smith's suggestion, all I have got to suggest is what I did before, at least, what I think I did before, having regard to the fact you are sitting with the Board under a statute and not as some Commission I am doubtful whether or not, although there may be merit to it, whether or not the Board would be entitled to say to any applicant, "So everybody back to New York, 'Frisco or Seattle until we decide that, and then we will come to the next step, and the next step." I think the applicants are entitled under this Act to make their application, subject to the Board's discretion as to procedure. I am doubtful whether or not it might cause a great deal of trouble in future that we do not anticipate now. If the Board just wiped all these witnesses out and stayed with reserves and said, "We will make a decision about that and let you know, if we agree one way, come back, if we agree the other way do not come back, including Prairie, of course, don't come back."

MR. S.B. SMITH: I think it is fair to state that Mr. Clarence Smith appears to think that there is very considerable merit in my suggestion, but there are perhaps



Discussion.  
D. S. Goodbody,  
Cr. Ex. by Mr. D.P. McDonald.

- 767 -

difficulties in achieving this course. With every respect, sir, I suggest that time is very apt to be gained by following that course, and that it is the sensible and the reasonable course.

CROSS-EXAMINATION BY MR. D.P. McDONALD:

- Q In view of the discussion, sir, there is not a great deal that I can deal with with this witness until we have the information which I consider essential. Would you turn, sir, to the map of Route B that you have at the back of Exhibit 15. This map is drawn with reference to the cost units that you have set out in your tables?
- A It is drawn to indicate them, yes, the location.
- Q Just dealing with the main lines, now, the main line in Alberta and British Columbia you calculate at 170 miles?
- A Yes.
- Q And the main line in the United States you calculated at 652 miles?
- A Are you reading those?
- Q 652.4?
- A 632.5, I think. Wait a minute now.
- Q Is it the 7th table?
- A 652.1 is what we have there.
- Q Then the Vancouver to Aldergrove spur, lateral, is 27 miles?
- A Yes, I think that is what it is.
- Q That is a total of 849 miles?
- A 652.
- Q The International Border at Aldergrove to New Westminster is 27 miles?



12-12-14

12-12-14

12-12-14

12-12-14

12-12-14

12-12-14

12-12-14

12-12-14

12-12-14

12-12-14

12-12-14

12-12-14

12-12-14

12-12-14

12-12-14

12-12-14

12-12-14

12-12-14

12-12-14

12-12-14

12-12-14

12-12-14

D. S. Goodbody,  
Cr. Ex. by Mr. D.P. McDonald.

- 768 -

A Yes.

Q That gives you a total of 849 of what you could call main line?

A If you want to include in that the 170 and the 652 and the 27?

Q Then we have lateral Trail to Waneta of 13 miles?

A 80 miles in that lateral altogether.

Q And from the International Border to Waneta to Newport?

A That is 68.5.

Q  $68\frac{1}{2}$  miles?

A Yes.

Q And lateral to Renton and Bothel is 23 miles?

A There are two laterals in there.

Q A total of 23 miles?

A A total of 23, yes.

Q And lateral to Tacoma is 16 miles?

A Yes.

Q The lateral to Everett is 7.8 miles?

A Check.

Q Lateral to Centralia is 8 miles?

A Yes.

Q And the lateral to Hanford is 70 miles?

A Yes, that is right.

Q Then you have Kimberley we did not take into account, and that is 19 miles?

A Yes, that is about right.

Q Now, I add those up to 228.3 miles. That would give you a total of pipeline that you have shown in this exhibit of



D. S. Goodbody,  
Cr. Ex. by Mr. D.P. McDonald.

- 769 -

1,077.3 miles. Would you tell me, Mr. Goodbody, if this length of pipeline was the length of pipeline which was represented to the Committee of Railways and Telegraphs of the House of Commons? Do you know what was the length of line shown to that Committee with regard to Route B?

A In Ottawa?

Q Yes?

A I do not know that anybody got into the detail of the actual mileage on that. Yes, they did too. The Hanford lateral, I do not remember whether that was included or not. I do not remember what all was included in that at Ottawa so I would rather not say. The intention is that there is no change in it since we were in Ottawa and it should cover the same.

Q The identical map that you have here was reproduced and presented to the Committee in Ottawa and Route B had an item of 910 miles on it, with the identical cost, I believe, very close to the identical cost you have here. I was wondering if there has been any change?

A There has been no change.

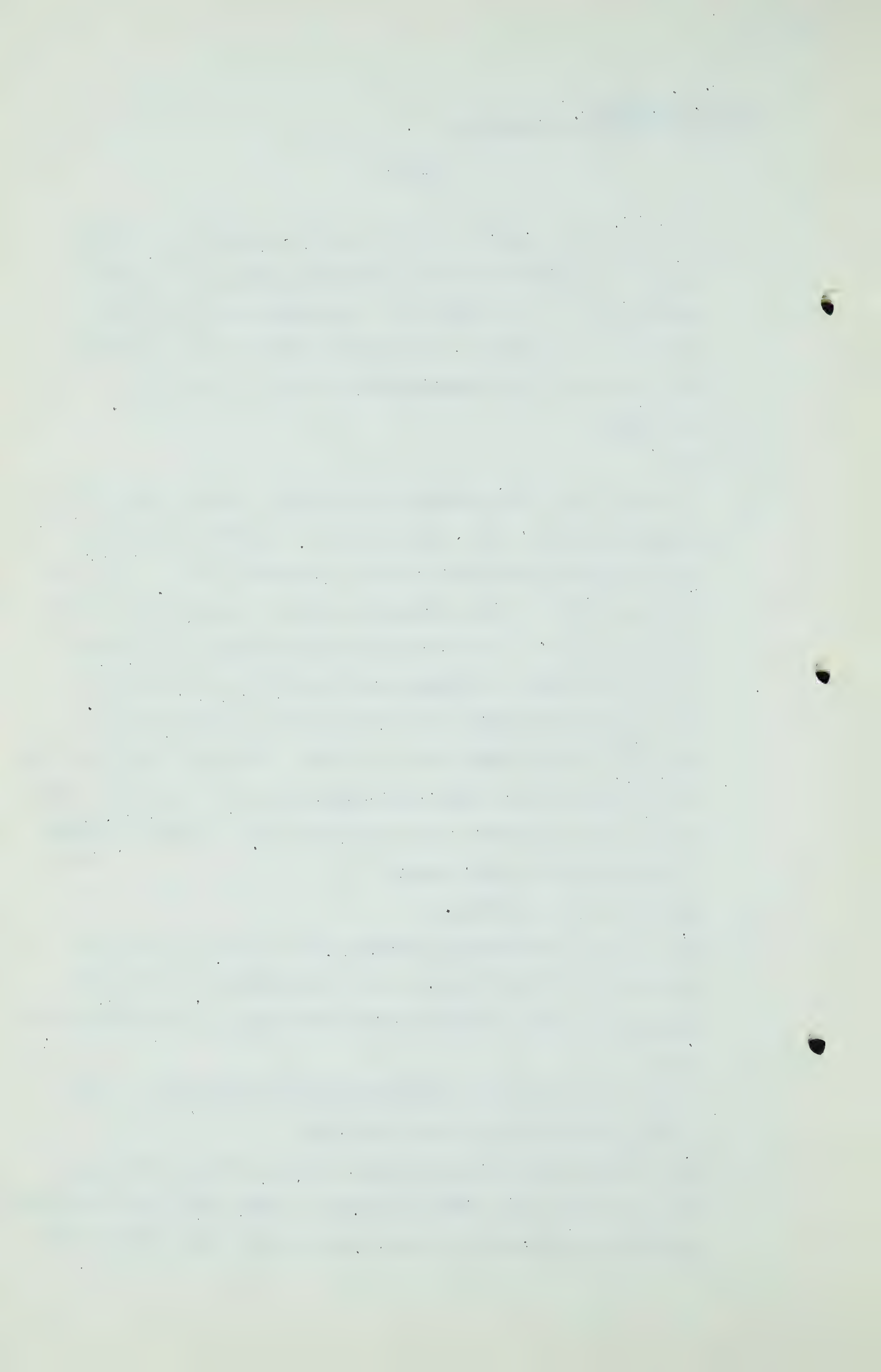
Q Now, I was just wanting to deal, Mr. Goodbody, with your calculation of the lengths. As I understand it, you were going to provide us with a sectional setup of classifications?

A Yes.

Q I was wondering if at the same time you could give us the scaling with regard to each section?

A Well, those sections are already scaled. What I will give you will show just like this sheet. These are scaled distances in this description, and as I said, in the text that we had,





D. S. Goodbody,  
Cr. Ex. by Mr. D.P. McDonald.

- 770 -

we added 3% to the scaled distances or the measured distances by speedometer.

MR. NOLAN: They were provided to counsel and the Board two strip maps. I wonder if they contain the information Mr. McDonald is speaking of. Incidentally, they never had a number. Perhaps, with your permission, they could be given a number. The first one being Alberta Natural Gas Company Preliminary Survey, Gas Transmission Pipe Line, Yahk, B.C. to New Westminster, B.C., Route A.

ALBERTA NATURAL GAS COMPANY  
PRELIMINARY SURVEY, GAS  
TRANSMISSION PIPE LINE,  
YAHK, B.C., to NEW WESTMINSTER,  
B.C., ROUTE A, NOW PUT IN  
AND MARKED EXHIBIT 17.

And then I would offer, sir, the other strip map of the Alberta Natural Gas Company and The Northwest Natural Gas Company, Projected Natural Gas Transmission System, Macleod, Alberta, to Aldergrove, B.C., Sections A to T.

ALBERTA NATURAL GAS COMPANY  
AND THE NORTHWEST NATURAL  
GAS COMPANY, PROJECTED  
NATURAL GAS TRANSMISSION  
SYSTEM, MACLEOD, ALBERTA,  
TO ALDERGROVE, B.C., SECTIONS  
A TO T, NOW PUT IN AND MARKED  
EXHIBIT 18.

THE CHAIRMAN: Is anybody going to substantiate these exhibits here or give the information on them?

MR. NOLAN: Yes, I think this witness should do it. I am prepared to do that as soon as Mr. McDonald is through.

MR. McDONALD: I would like you to do it now. I would like to know what they are.



D. S. Goodbody,  
Dir. Ex. by Mr. Nolan.

- 771 -

Q MR. NOLAN: Now, let us take No. 17. Will you take exhibit No. 17 and tell me what it is?

A It is a strip map developed from the line location that was made on existing or on procurable maps. Some of them are Canadian Government maps and some of them are Provincial maps of Alberta and Provincial maps of British Columbia. This does not go into the United States.

Q This is Route A?

A Yes, sir.

Q And the scale is what?

A This now is reduced, I think, to  $\frac{1}{2}$  inch per mile.

Q 1 inch to 2 miles?

A It has been reduced.

MR. C.E. SMITH: The scale is on each page.

Q DR. GOVIER: Mr. Goodbody, does that scale refer to the present scale after reduction or before reduction?

A That is what I was checking. That is present scale.

Q MR. NOLAN: So it is  $\frac{1}{2}$  inch to a mile?

A Yes.

Q Now, looking at the first page, what is the point A?

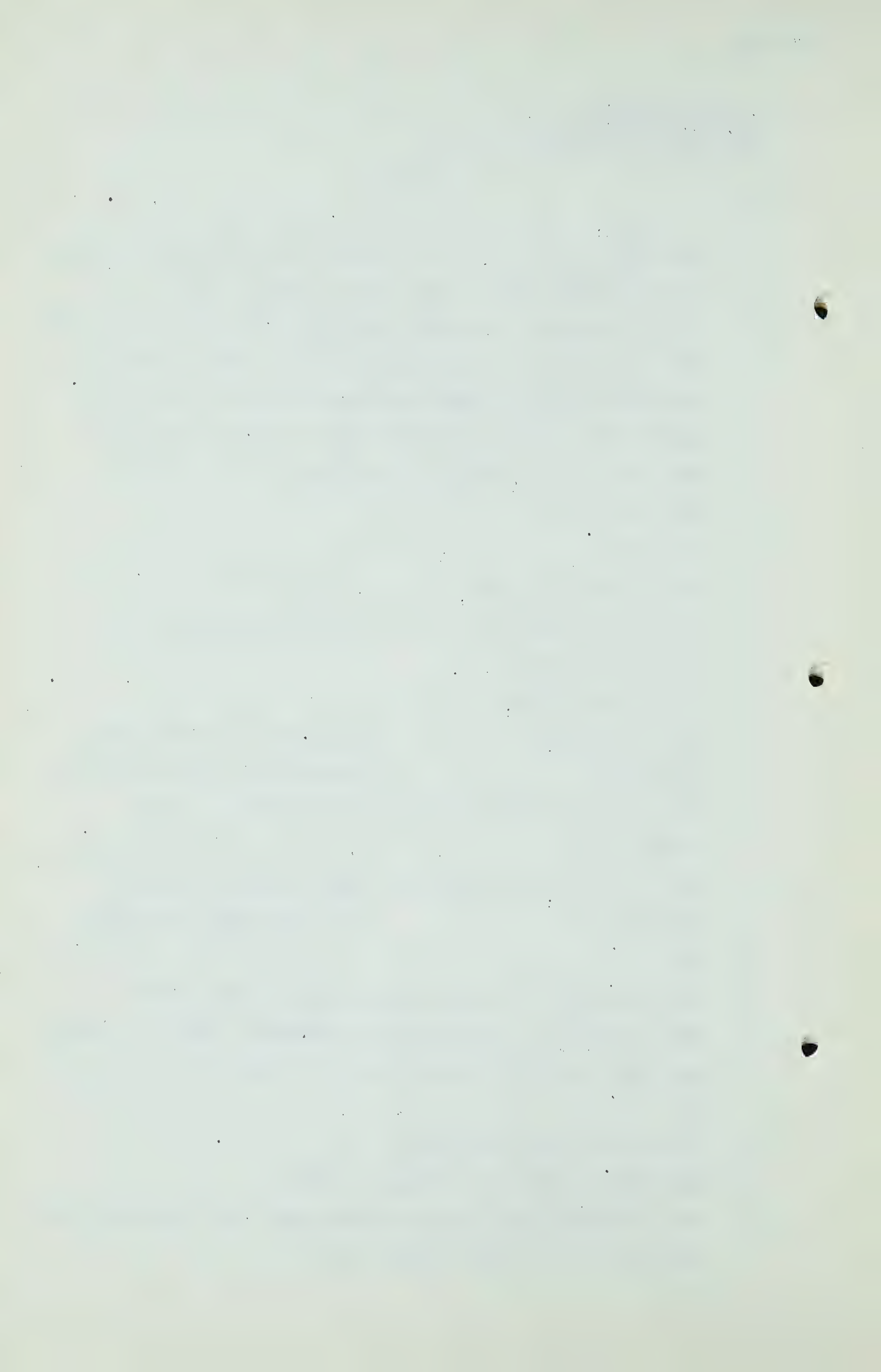
A That is near the intersection of Highway 3, where the highway from the United States, No. 95 I think it is, intersects it.

Q It is not Pincher Junction?

A No. That is near the Village of Yahk.

Q Well, does the line appear on this map? Just describe it to us so that we will know what it is.





D. S. Goodbody,  
Dir. Ex. by Mr. Nolan.

- 772 -

A Well, it is as near as possible to where we think the line should go along this route.

Q And then whenever it crosses a railroad or a river or a highway there is enough put on the map to show that crossing?

A We have tried to pick up enough of the existing topography to make it so it can be orientated.

Q And you only do that along the actual route itself?

A Yes, that is all.

Q I notice in the middle of the first page you cross the C.P.R. once?

A Yes.

Q And that is indicated?

A Yes, that is indicated.

Q What are those small figures that I see running along, 11.7, 21.2?

A Those are the mileages from the station near Yahk.

Q And the lines shown as black and white are highways?

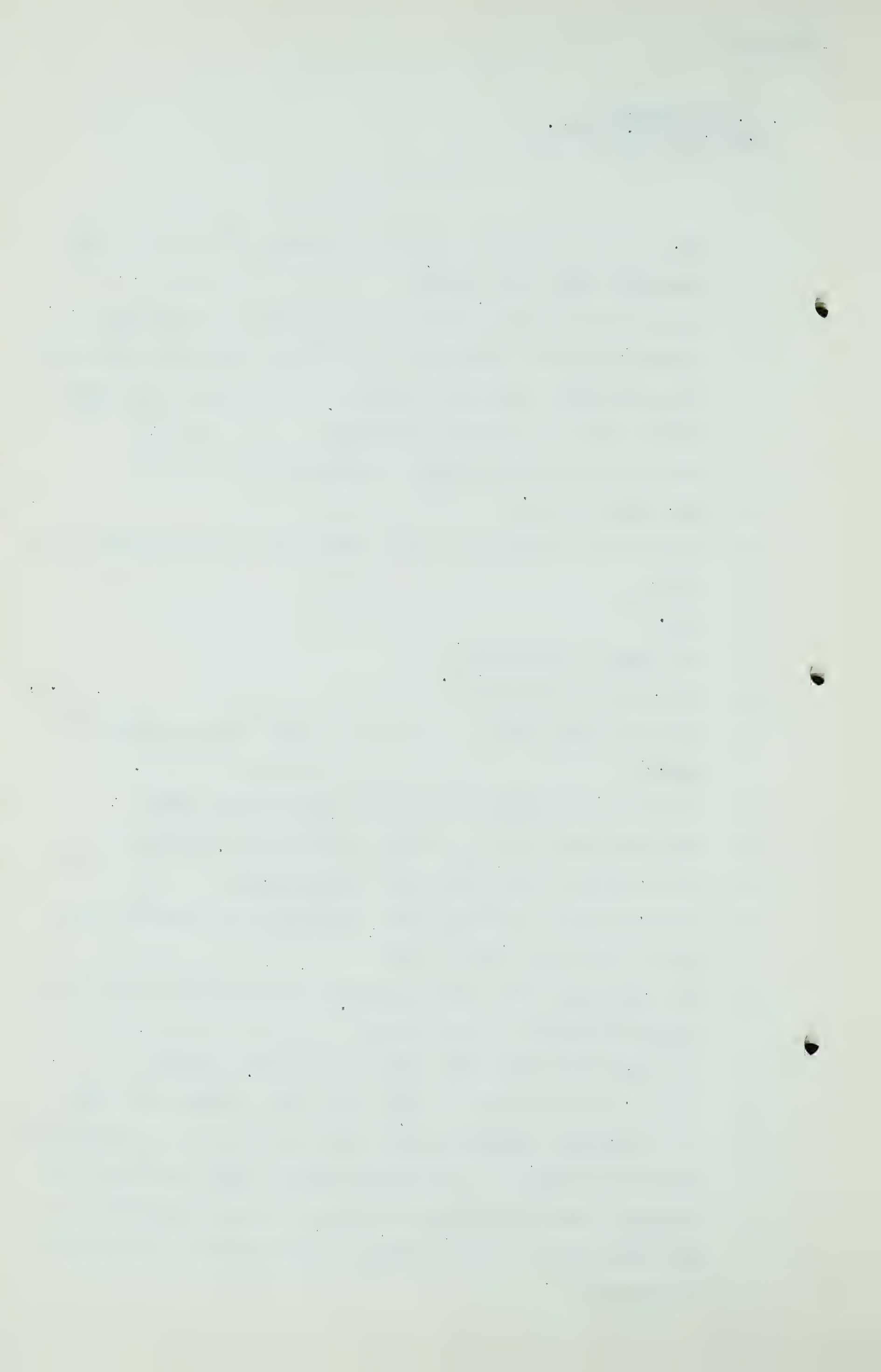
A Yes, those are existing roads or highways.

Q Yes. Is there anything else to be said particularly about that first page? What is D?

A Oh, those are just joining points. We had those in a long strip and we had to cut it up.

Q It just shows where the join of each page comes?

A Yes. You might want to bring this in. We have added 25% to the scaled distances. We plotted a line on the topographic sheet and scaled it and we added 25% to that area from the Kootenay River or from the bottom of the hill near the Kootenay River to Salmo Valley, we added 25% to our scaled distances.



D. S. Goodbody,  
Dir. Ex. by Mr. Nolan.

- 773 -

Q Why did you?

A Well, because the country is so rough it is a practical impossibility to draw a line on a map of a mile or half a mile or two miles to the inch that would be accurate. It is merely an indication, I would say. The line through there is merely an indication that we propose to go through that particular area.

Q And when the country is less rough there would be a less percentage added to the scaled distance, because the next page, it is not numbered, but it is the B and C page, there is only .20% added.

A That particular addition is made to the section from Trail.

Q To Cascade?

A To Cascade, yes. That is where that 20% is added, for that particular area in there. The same thing applies to it. And then of course the 3% addition has been made to the entire length of the line to take care of deviations.

Q On this page B-C, let me call it that, you see a figure about the middle of the page at the top of the long, vertical line 1.7 degrees?

A 117 degrees and 30 minutes. Those are longitudinal references, to take them off of the topographic map.

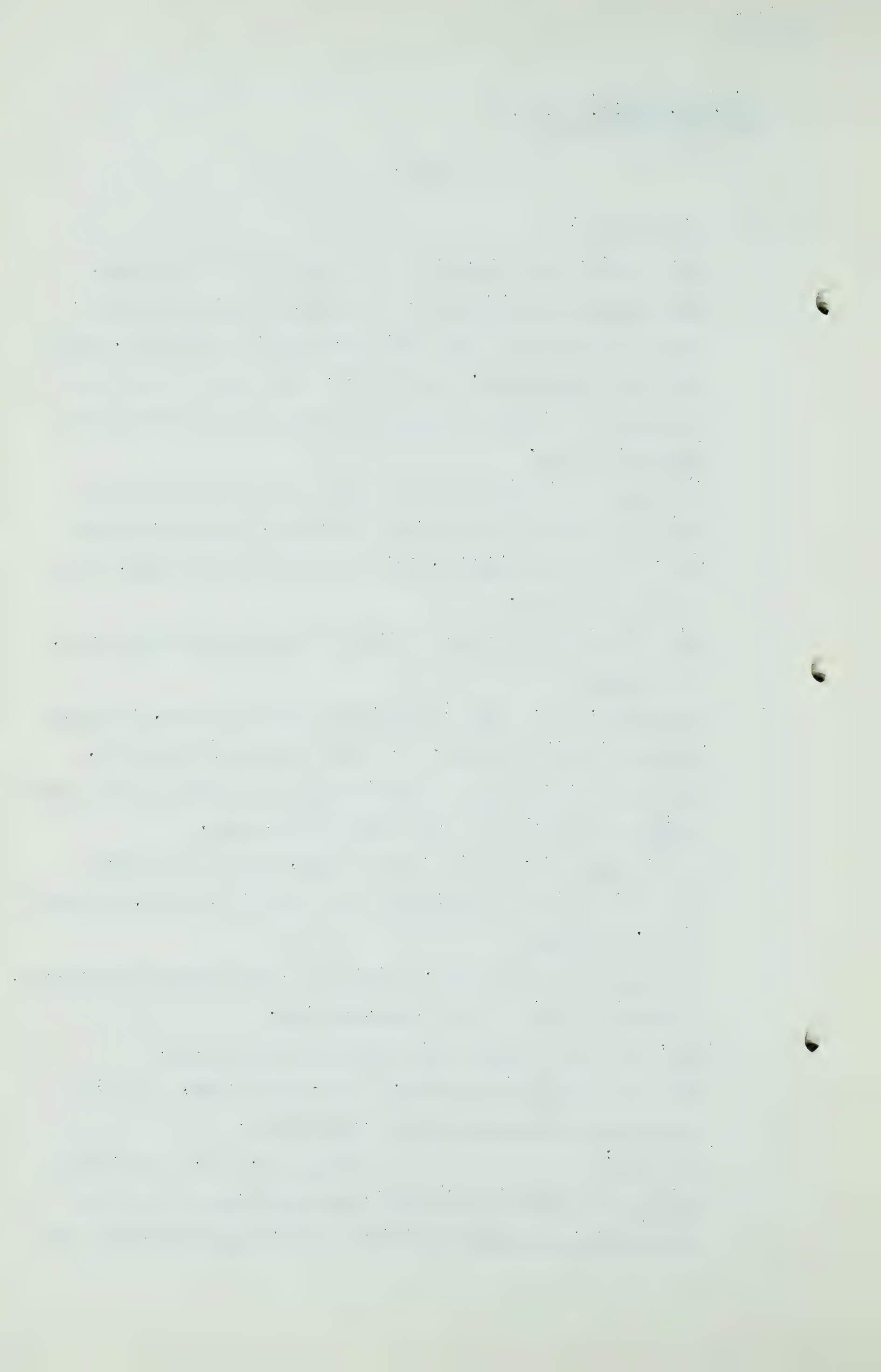
Q Well, there is nothing very noteworthy about them?

A There is nothing of any note. The Allison Pass, we took our distances through there by speedometer.

MR. NOLAN:

I might say, sir, that while we can not provide my friends with them because they are unobtainable, we have what I call aerial photographs of some





D. S. Goodbody,  
Dir. Ex. by Mr. Nolan.

- 774 -

of these areas and some topographic maps that we would be glad to file or furnish for the information of anyone, of the Board or it's engineers or my friends. It is not possible to make complete sets. It is quite impossible to reproduce them in the numbers required for a full distribution. As I understand from my advisors, this would be helpful in interpreting these strip maps.

THE CHAIRMAN: If you care to file them with the Board we will make them available.

MR. NOLAN: We will file them now. The reason I thought I would not file too many maps in the beginning, I thought we would get cluttered up with maps and would be looking at the wrong one. Perhaps they could be given one number, sir.

MAPS AND AERIAL PHOTOGRAPHS  
PUT IN AND MARKED EXHIBIT 19.

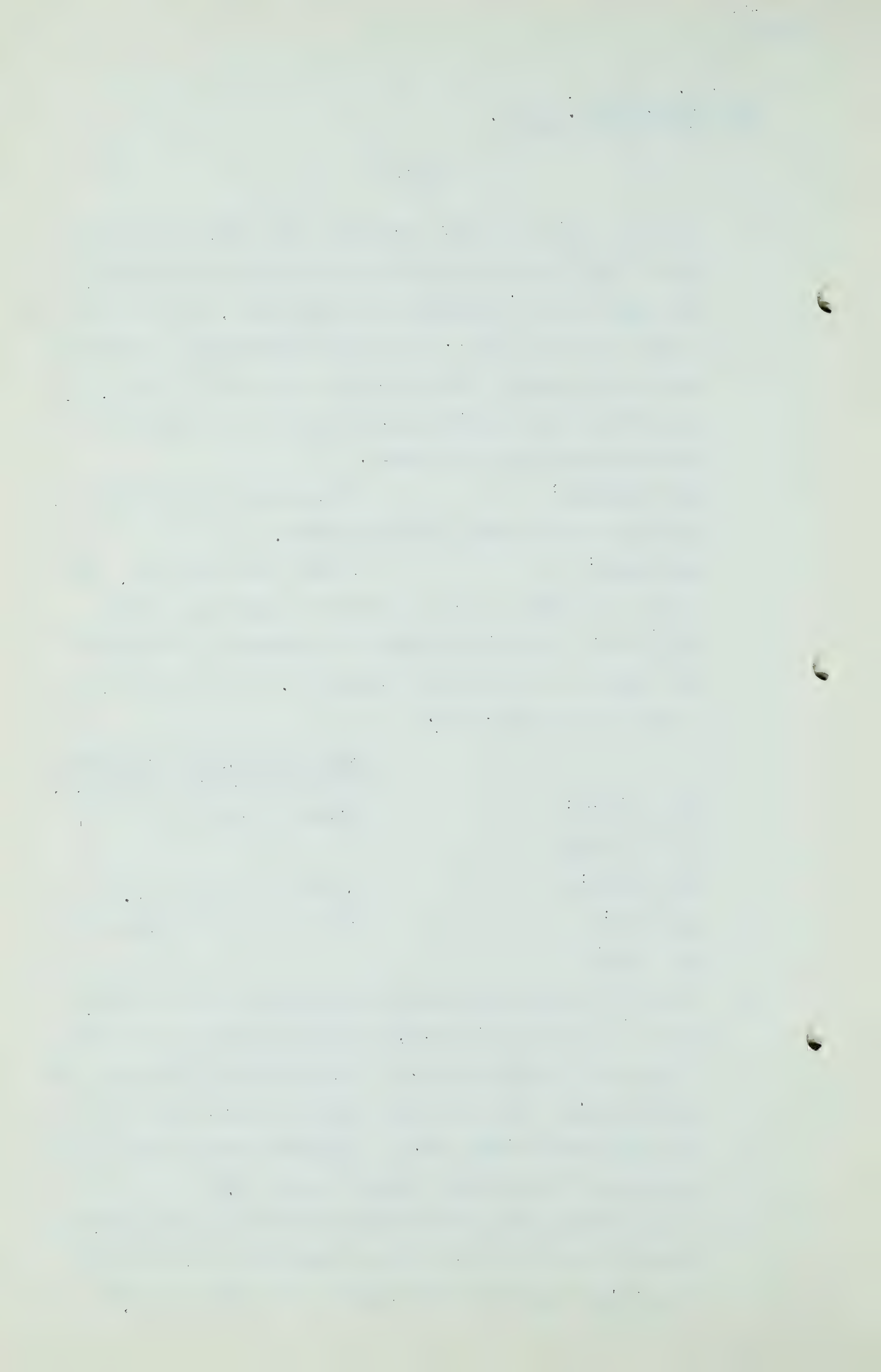
THE CHAIRMAN: Perhaps we could get a list made of them?

THE WITNESS: No, we do not have one.

Q MR. NOLAN: Those are both topographical and aerial?

A In some portions there are no topographic maps available. Some in there are just blank, nothing on them. Two sheets I have not been able to get. I have them at home and I can send them up. They are about Cowley and Blairmore and I do not have them in that group. Those are the only two I know of that are in existence that we do not have.

Q I am informed there are no maps available for the Province of Alberta and that the line as proposed is indicated on those maps, they have been drawn on in various colours.



D. S. Goodbody,  
Cont'd. Dir. Ex. by Mr. Nolan.

- 775 -

Q The reason for that variation in colour is because the backgrounds of the maps themselves vary in colour, but the line has been put on so that they may be of some use. They are very awkward to handle because some of them are very large, but we are glad to make them available and we are sorry we have not a complete set of each of them, so that they would be available for everyone.

MR. C. E. SMITH: Have they been marked?

THE CHAIRMAN: Yes.

MR. C. E. SMITH: What do they call them, what were they called, just a bundle of maps?

THE CHAIRMAN: Maps.

Q MR. NOLAN: I think perhaps I should ask the witness, sir, to make a word of explanation as to these, because it is important for the record that we know what they are.

A Do you want me to deal with the bundle of them?

Q MR. NOLAN: You may explain them.

A I have got them down here and I have cut them down as much as I can. We will be all over the Court Reporter here. Now, these maps were procured from the British Columbia Forest Service, they are not a general issue map, but they will print them on request. This covers the area from Crow's Nest Pass to Kingsgate.

Q Did you give the Board the scale of the map?

A These are 2 inches to the mile, I believe. Yes.

Q And is that what is known as a contour map?

A Yes, that is what is known as a contour map. This one was prepared by compassing, by compass and chain surveys, and





D. S. Goodbody,  
Dir. Ex. by Mr. Nolan.

- 776 -

they use the railroad for a base line.

Q Now, have you marked the line on that map?

A Yes, the line is marked, the approximate route of the line is marked in red on that map.

Q The route of the line is marked in red on that map, the approximate route?

A Yes.

Q I do not know that we need to identify each one, Mr. Goodbody?

A Do you want a number - do you want a list of them as we go along?

Q We could make a list now. We can say this, "We have got 1, 2, 3, 4, 5 countour maps".

A 6 of the British Columbia Forest Survey maps, the British Columbia Forest Service maps.

Q Were there larger scale maps available?

A I beg pardon?

Q Were there larger scale maps available?

A As far as I know, I do not know of anything else. I do not know of any other contours. I have not been able to find any other contour maps in this area.

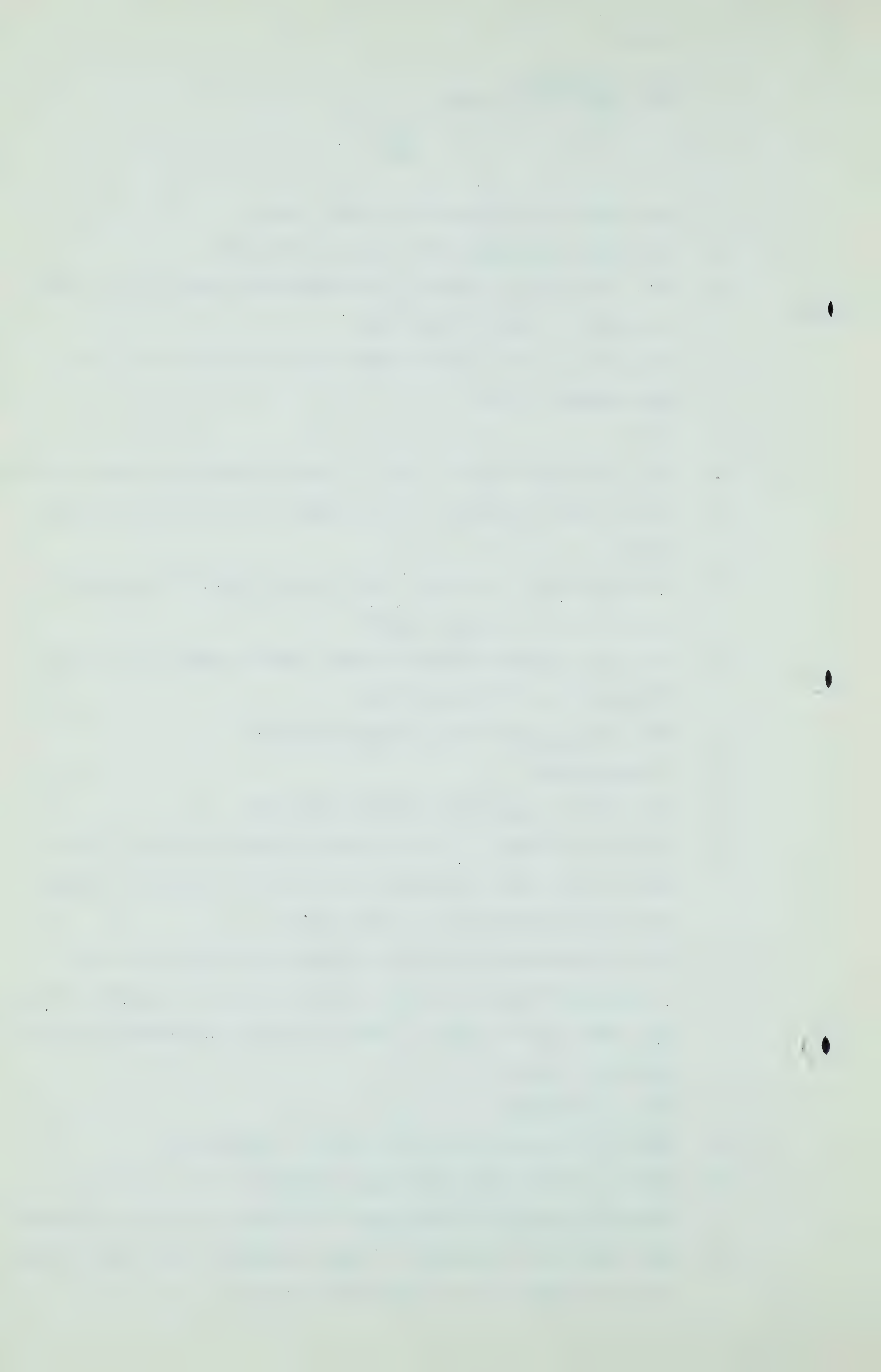
Q We did endeavour to get the largest scale maps we could because we found the smaller maps were not so useful. Well, now, what are the next? Those are what are known as contour maps, are they?

A That is correct.

Q What is this next lot that you are looking at?

A This is a land map drawn by, I believe it is, it is a Provincial map, the Department of Lands of British Columbia.

Q And does this next group of maps represent the areas through which the line runs in British Columbia?



D. S. Goodbody,  
Dir. Ex. by Mr. Nolan.

- 777 -

- A Well, this one was included, this line on this one of the Cranbrook sheet is included. They were not long enough to get the line up to Kimberley, so that there is this sheet in to show the line going to Kimberley.
- Q The line going to Kimberley?
- A Yes. There is one contour sheet that is available for Cranbrook, but it does not come down on to our main line.
- Q What are the other maps?
- A These are contour maps that are available. These are by the British Columbia Land Department.
- Q And does our line appear in green on those maps?
- A Yes, our line appears in green on those maps, on all of these, and they run right through to the end here.
- Q How many are there, for the record?
- A There are six of that size and of that issue.
- Q And who gathered these maps together?
- A We gathered them.
- Q Who gathered them?
- A We gathered them, the people that worked with me and myself.
- Q You mean your company?
- A Yes.
- Q And who marked them?
- A We marked them. I marked some of them. Mr. Copp marked some of them. He helped me mark them.
- Q He marked them under your supervision?
- A Well, we were working together, yes.
- Q Yes?
- A Now, there is just one thing, I would like to say one thing, there is a map in between the Hope-Princeton sheet and the





D. S. Goodbody,  
Dir. Ex. by Mr. Nolan.

- 778 -

Chilliwack sheet. I could not find anything to cover it at all. We had to draw the line ourselves.

Q Now, you did make an effort to find the map to cover that?

A Yes, I did make an effort to find the map to cover that, but I couldn't find it. There are three maps of this size (indicating).

Q Now, what is your third sheet?

A These are produced by the U. S. Geological Service, some of them are quite old.

Q And they show, I suppose, the States of Washington and Oregon, parts of them?

A They go through the States of Idaho and Washington, and we have one that goes into Oregon.

Q And the line has been marked in what colour on this map?

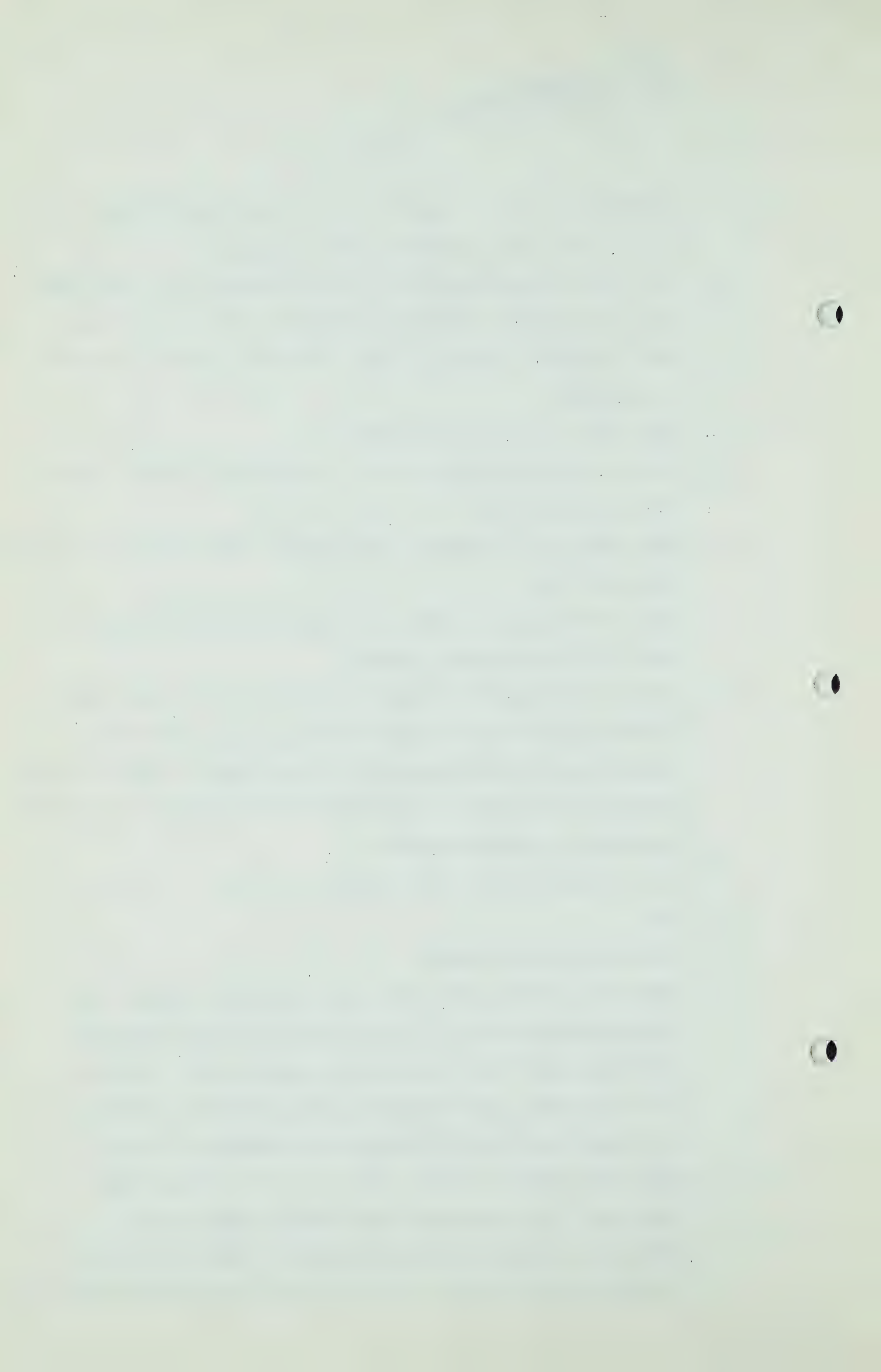
A On those maps some of them red and some of them green, depending on the backgrounds of these maps, so that we have marked our colouring according to the background. We marked according to the background.

Q But each map has the line on it?

A Yes.

Q How many in this group?

A There are 9 here. And here again, the only thing, there are some maps in here, the only thing that was available was County maps that do not mean a great deal, as far as they show some of the existing roads on them, and some of the roads they show on them are not passable, but they were maps along in there. There were no contour maps available. The areas where the contour maps are not available are flat country, generally. Some of this is a little questionable. It is so old in the Stevens Pass that



D. S. Goodbody,  
Dir. Ex. by Mr. Nolan.

- 779 -

the only thing that is good on it, I would say, is the course of the river, the railroad itself has been changed and the highways have been put up through there and a great many houses have been built up in there since these maps were issued.

Q You say they are so old, how old are they?

A This one is dated 1904, but surveyed in 1901. It is pretty old.

Q I was alive at the time. What is the next group?

A The next was for the area beyond this. There were no topographic maps available, and these are photographs by the U. S. Army Engineers that we were able to procure.

Q Those are really airplane photographs that were produced?

A Yes, that is correct.

Q Have you been able to mark your line on those?

A Yes, we have our line on these all the way through, and there is one of these is missing, that is not available, but we have everything from then on. I will give you the number first.

Q Yes?

A There are 11 of those. And then we are back now to maps that are the same as those (indicating), some of them are more recent.

Q Are they American or Canadian?

A These are all by the U. S. Geological Service.

Q They are all Oregon and Washington?

A Yes.

Q But they are not complete?

A This is complete. This set from here on is complete and covers everything on our routes through Monroe and from the





D. S. Goodbody,  
Dir. Ex. by Mr. Nolan.

- 780 -

boundary near Vancouver down to Portland, Oregon. These are complete.

Q Yes?

A I will give you the number of these.

Q Yes?

A There are 15.

Q Well, now, do they form the background for what we call these strip maps, Exhibits 17 and 18?

A Yes.

Q And so this information that we are now considering, and have before us, was obtained from these maps so far as the topography was concerned?

A These maps were produced, and all the topography and everything came from those sheets.

Q Yes, and your company did all the work?

A We had it done, yes. That is, we had the drawings made and the printing was done in New York.

Q Now, Page C-D continues on, showing us the route of the line, and I see that there are a good many highway crossings in this sector. I am looking at Exhibit 17, page C-D?

A Yes.

Q That means, of course, what? That the route is winding through there?

A That is the section between Trail, or from Rossland onward to Cascade, and I believe there is some 40 odd miles of road in 24 air miles across there. It is pretty rough country.

Q Yes, and turning then to D-E, there are fewer highway crossings?

A Yes. The country from Cascade across to, well, just West



D. S. Goodbody,  
Dir. Ex. by Mr. Nolan.

- 781 -

of Grand Forks, is quite flat farming country, and then we cut right across over the range of hills in there around Midway.

Q That is the area of the Kettle Valley, isn't it?

A The Kettle Valley Railroad, it is called. It goes through the Kettle Valley road, and the Kettle Valley goes into the United States.

Q What are these mining divisions that are indicated on these sheets?

A I am not sure. Those mining divisions are shown on these maps and we used it because they were shown, but what the legal status of them is I do not know. I believe they are recording districts for mining claims.

Q Then on Sheet E-F you cross the highway several times?

A Yes.

Q And then you go around the end of Osoyoos Lake, is that correct?

A Yes, that is correct.

Q And what sort of country are you talking about now?

A The country where we cross and re-cross the road is quite precipitous. It drops right from the prairie, it goes up to about 4000 feet and it drops down to the lake level, and from where we hit the slope leading into the lake and around the lake is more or less gentle sloping country of gravel formation. And then you get into a rock formation at the end of Osoyoos Lake, over the hill, and we are back along the level when we get along by the Similkameen River.

Q Going along to sheet F-G, I find the line there follows the highway for a considerable distance, for many miles.

A At the point where the - it follows along the highway and





D. S. Goodbody,  
Dir. Ex. by Mr. Nolan.

- 782 -

that is a travelled road at the present time?

Q Yes?

A I was just going to bring out where the railroad crosses the river, just past that, where the new highway crosses the river and runs up the other side, and this present road is a farm road. There is a new road on the other side that is not indicated on this map.

Q Yes?

A And the road shown now, while it used to be the main highway, is used for a farm road.

Q And that sheet F-G takes us as far as the Princeton?

A Yes, it takes us as far as Princeton.

Q And then we go to the next sheet, G-H, what is significant about that?

A We started up over the Allison Pass.

Q The Allison Pass is on this sheet, is it, or part of it?

A No, you do not get into the Allison Pass until you get over into the next sheet.

Q Yes?

A That is, the actual Pass itself is on the next sheet.

Q There is very little to be said about this except there are a number of stream crossings?

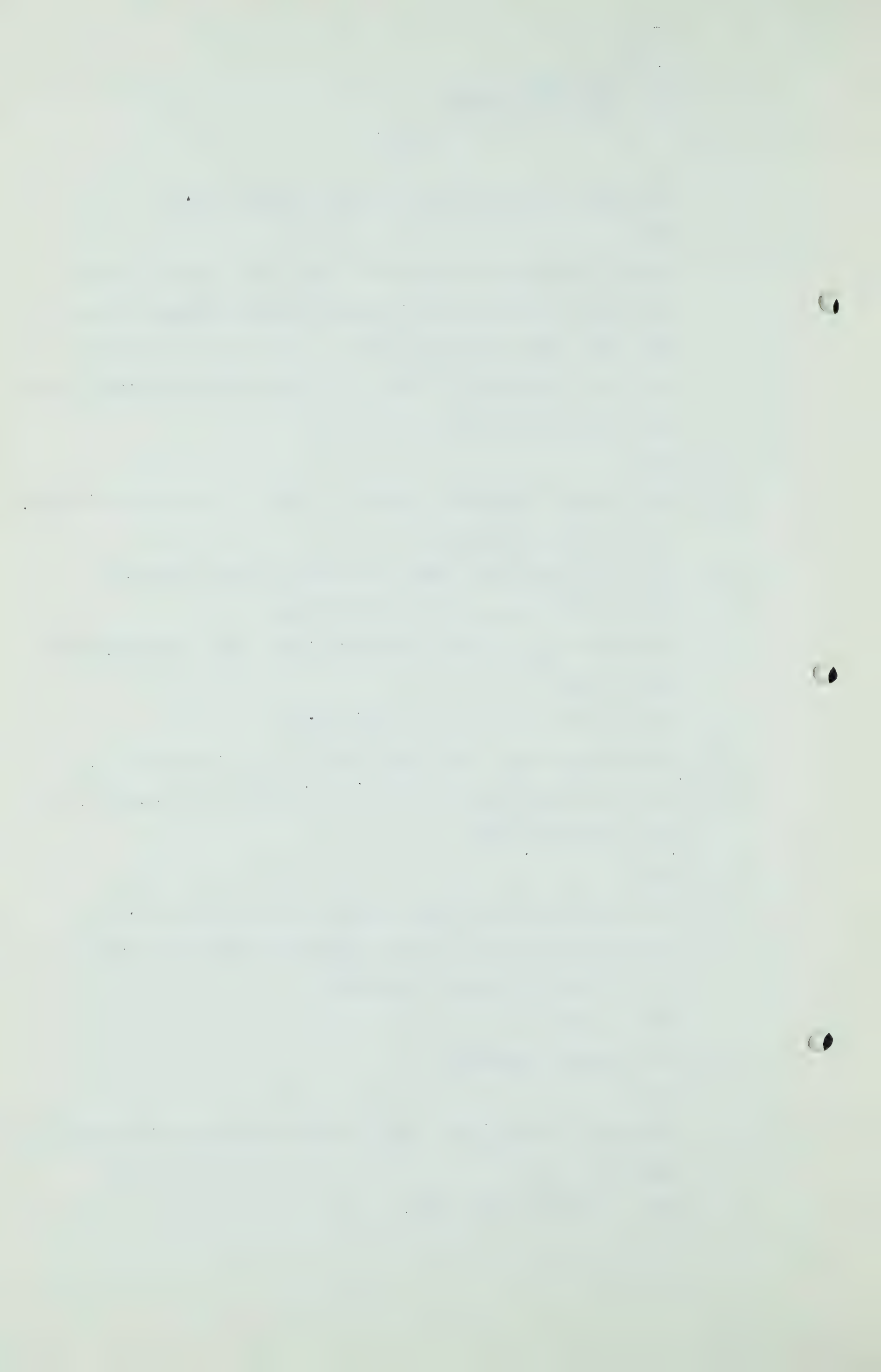
A That is all.

Q One highway crossing?

A Yes.

Q And then on sheet H-I, where we are following the Similkameen River?

A Yes. And then the Skagit.



D. S. Goodbody,  
Dir. Ex. by Mr. Nolan.

- 783 -

Q And then we are in the Allison Pass, are we?

A Approximately 319 is just about where the Pass is located.

Q And that is what is called the Memaloose Creek?

A Yes, it swings off from the Allison Pass.

Q The highway is not indicated on this particular map?

A No. I noticed that there is a highway crossing left out here, where we cross the Nicolum River, right in there we cross the highway and get on the other side of the highway. It should have been indicated there but it is not.

Q And that map takes us into Hope?

A Yes, just beyond Hope.

Q Well, yes, just beyond Hope?

A Yes.

Q Are you allowing any percentage there?

A No, that is just the normal 3%. There is a note on page I-J. The speedometer measurement was taken from Keremeos to here, that means to Bridal Falls, we measured that by speedometer reading.

Q Now, this one, I-J is from Hope westward?

A That is correct.

Q And we are running along the Fraser River?

A That is correct.

Q And there is not very much to be said about the line here, is there?

A No, it keeps on to the flat country there, after Bridal Falls.

Q All right. And then when we get to J-K we come into the New Westminster country, don't we?

A Yes.

Q And it is all pretty plain sailing, isn't it?





D. S. Goodbody,  
Dir. Ex. by Mr. Nolan.

- 784 -

A It is not bad, it is all good country through there.

Q Now, just a word or two about Exhibit 18.

THE CHAIRMAN: I think we might adjourn for about  
15 minutes.

MR. NOLAN: I am sorry.

(Hearing resumed after short adjournment.)

Q MR. NOLAN: Now, turning our attention to  
Exhibit 18, and that is the section from Macleod, Alberta  
to Aldergrove, B. C., running through the United States?

A That is correct.

Q And the first page is from Pincher Creek, is it, about?

A Well, the line starts up at Macleod. Actually, that was  
the original drawing and the line now in our submission is  
starting at Pincher Creek Station.

Q And the succeeding pages carry on in the same manner?

A Yes.

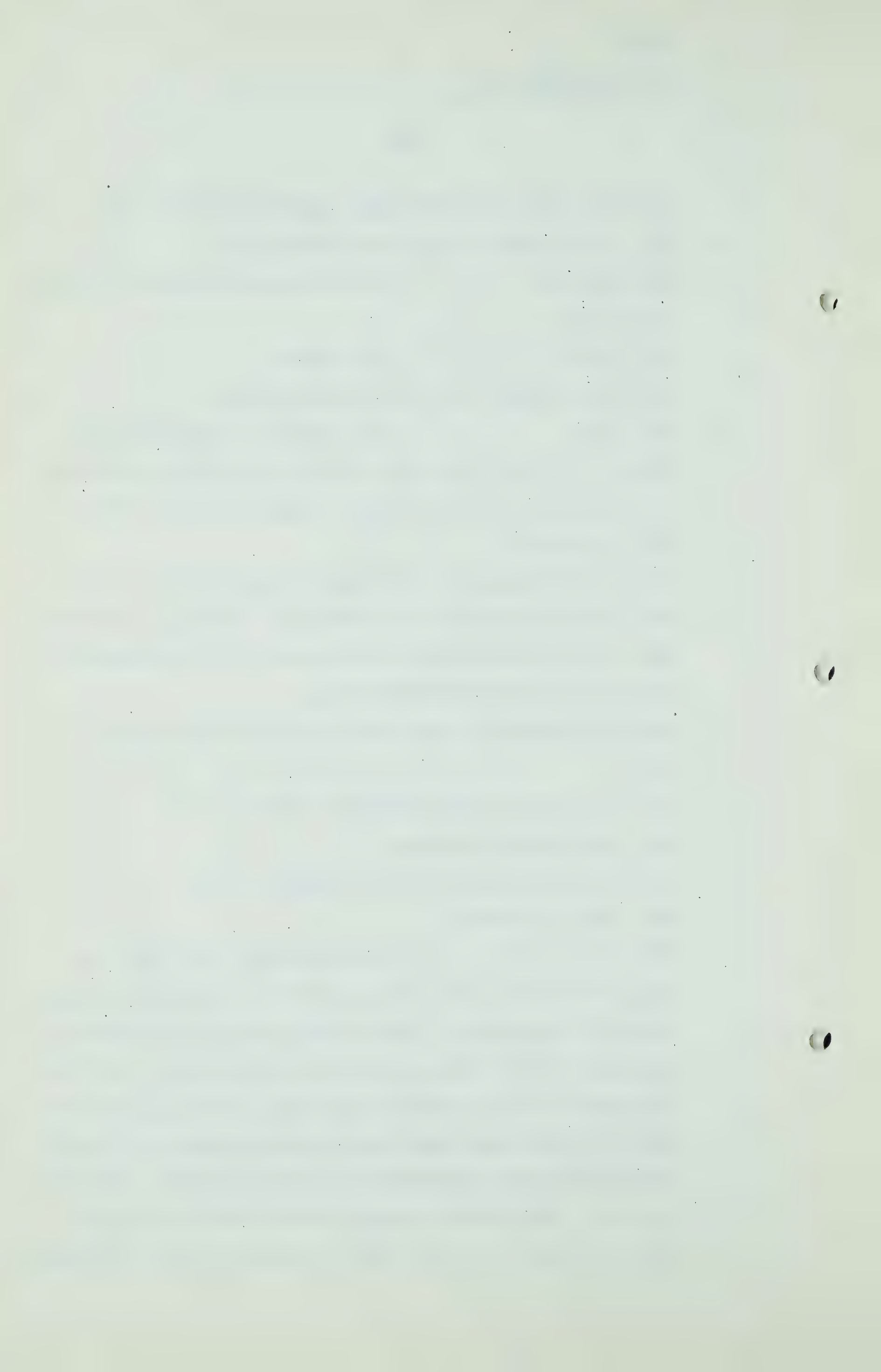
Q With the same legends showing on there?

A Yes, practically the same.

Q And it proceeds all the way along the route?

A Yes, that is correct.

MR. NOLAN: I do not think, sir, that I am  
going to take the time of going into this page after page,  
if you do not insist. We look upon these as work sheets,  
you see, sir, and then, of course, some time ago they were  
distributed to all parties concerned, and that is why we  
did not do any more than put them in, because we treated  
them as supporting material to our main evidence that was  
submitted, but perhaps enough has been said to identify  
them, to point out what they are intended to be and intended



D.S. Goodbody,  
Dir. Ex. by Mr. Nolan.  
Cr. Ex. by Mr. McDonald.

- 785 -

to do, and enough information for my friends to ask questions upon them, if they so desire.

CROSS-EXAMINATION BY MR. McDONALD.

Q Mr. Goodbody, if you will deal with Exhibit 17, I think it is?

A Yes.

Q And take the first page. I just want to clarify my understanding of this exhibit. We start with 0 mileage at the letter A?

A Yes.

Q At the left-hand side where you have the line "0 = 7.7 miles" from Kingsgate?

A Yes.

Q And then we get to B on the far side. We will take the first number there, 39.5 miles?

A Yes.

Q Do you see that, 39.5?

A Yes.

Q Does the 39.5 miles include the 25% added to scale distance?

A I am sorry, I meant to make that clear enough. The 25% is only added from the foot. of Summit Creek at the Kootenay River.

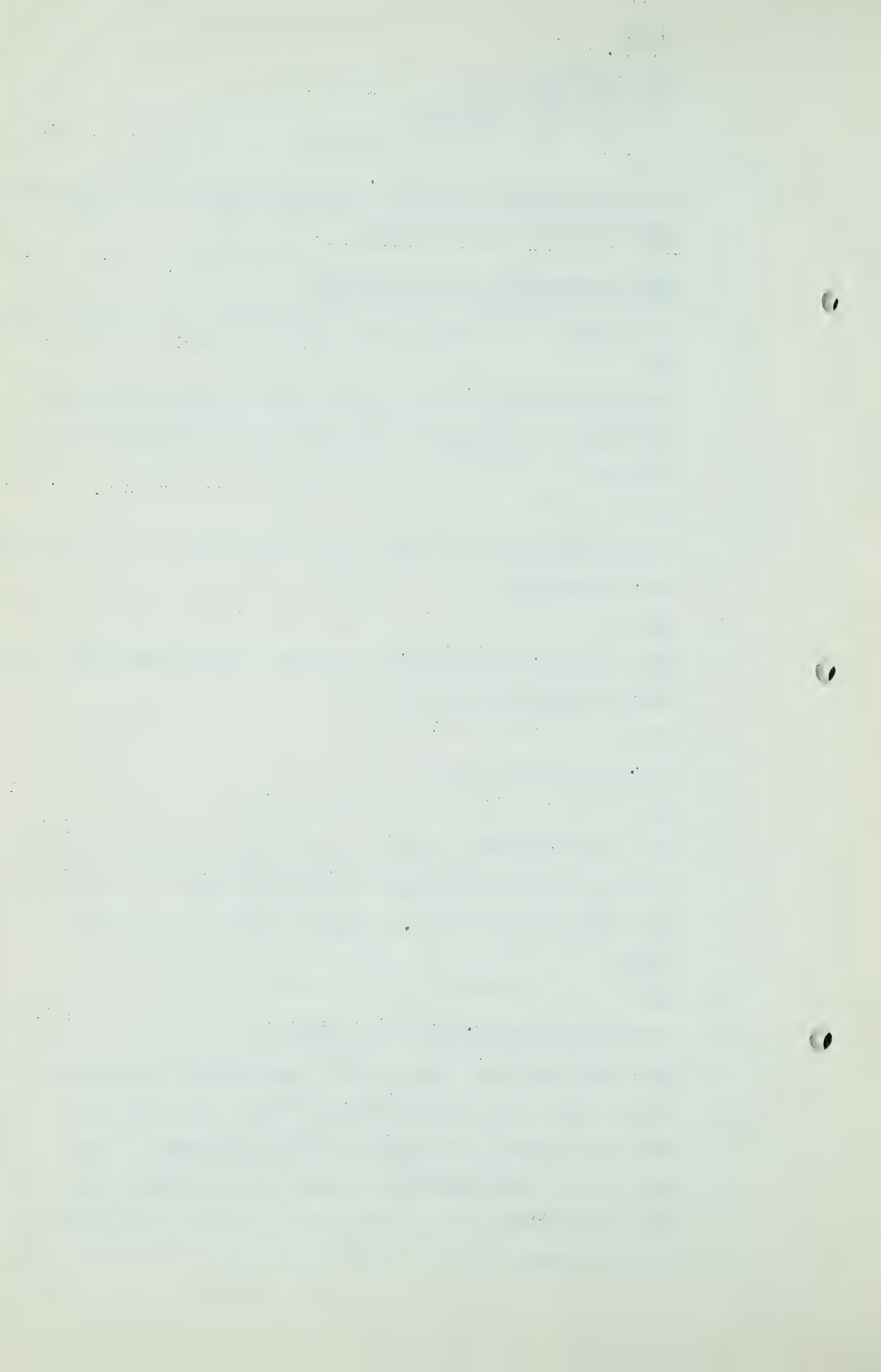
Q Yes?

A It was added between there and Salmo.

Q But I mean the 39.5 does include whatever has been added?

A No, it does not include anything. There is no addition. That is just the scale miles, the scale distance of the map, of the topographic map, except those sections that are marked, the section going over the Nelson range and the section between - -





D. S. Goodbody,  
Cr. Ex. by Mr. McDonald.

- 786 -

Q Keremeos?

A Trail and Cascade, Lake Christine, I think.

Q And they are what?

A I put 25% on that section going over the Nelson range and 20% going over the Rossland Mountains there.

Q That is my difficulty. Is the 39.5 miles, is that on pipe going to be laid in that particular area, or is it 39.5 miles plus 25% of the mileage?

A If we are going to talk about the 25%, let us get over in the area where the 25% is added.

Q That is added on the first page.

A I beg your pardon, it is only added between the Kootenay River - -

Q Yes?

A And the Salmo Valley.

Q And the Salmo Valley?

A Yes, it is on the next page.

Q It is on the next page?

A Yes.

Q I see.

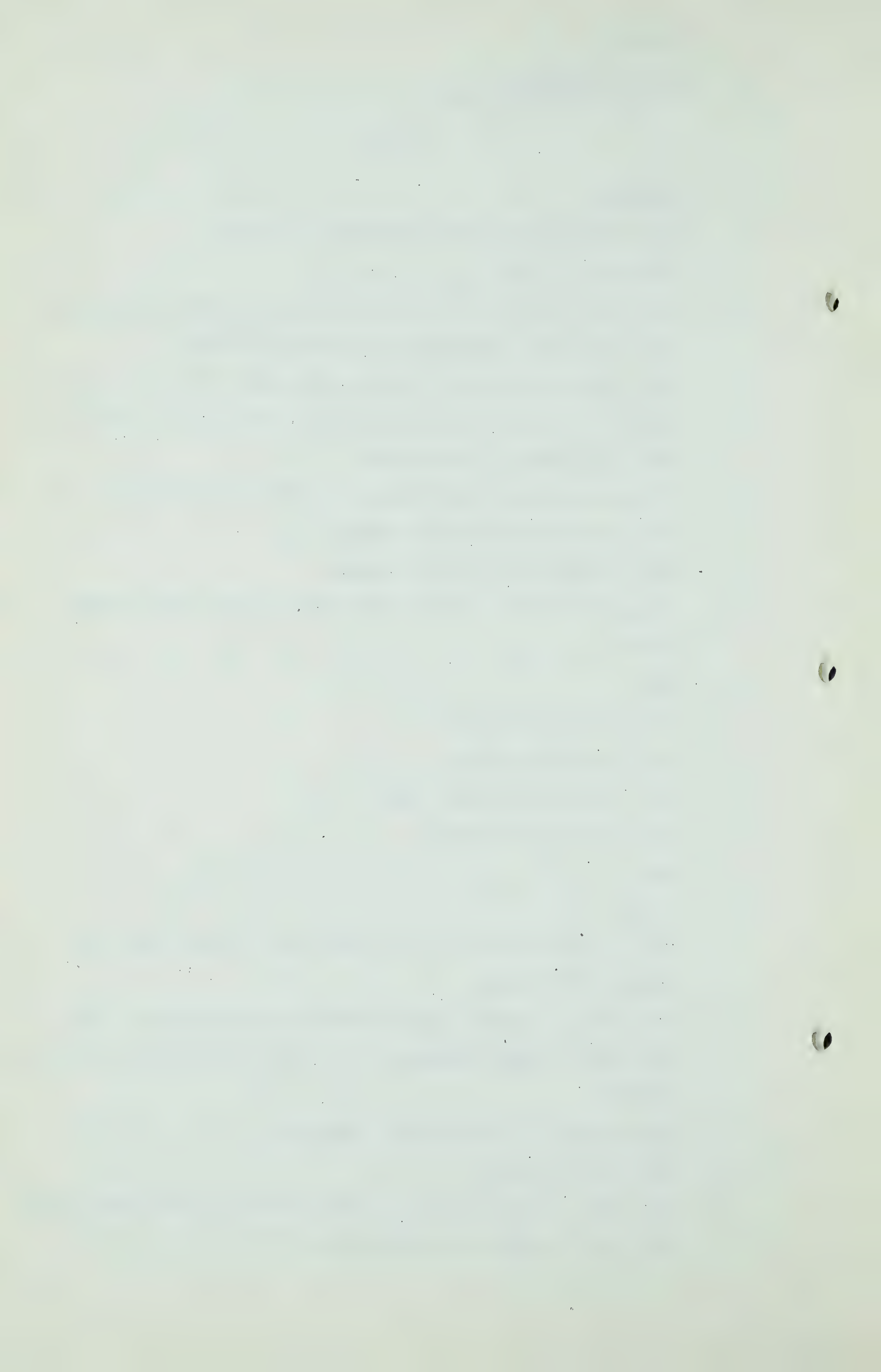
A That is taken care of in an equation, it says 60.3 back equals 68.8 ahead.

Q Oh, I see. So that the 73, whatever it is, we will take it to the closest mileage, 73.8, that includes your addition of 25%?

A Let us take it right at the equation.

Q That is the point?

A Yes, that is the point. In other words, I would have added 8.8 miles in there to take care of it.



D. S. Goodbody,  
Cr. Ex. by Mr. McDonald.

- 787 -

Q Yes?

A And then to this whole mileage, in my submission, in all of the units in the submission, I have added 3%.

Q Yes?

A It does not show up in here at all.

Q Let us get that. So that on your length of pipe at that point, where you have your back and ahead, your mileage is 68.8?

A In other words, in all of my units, it would be 68.8 plus 3% to take care of it, and that would appear in each unit.

Q And so that you have added 25% to your rough going and then again you have added 25% of your actual rough going?

A Yes, of that scaled difference.

Q Of that scaled difference from the Kootenay River to your back and ahead point?

A Yes.

Q And then in addition to that you have added 3% to that on your over-all figure?

A Yes.

Q Yes?

A Now the 20% is carried in the scaling across there. It is not picked up in an equation. I balanced it out on the topographic sheet as I was drawing it.

Q Have you a similar back and ahead item for this 20%?

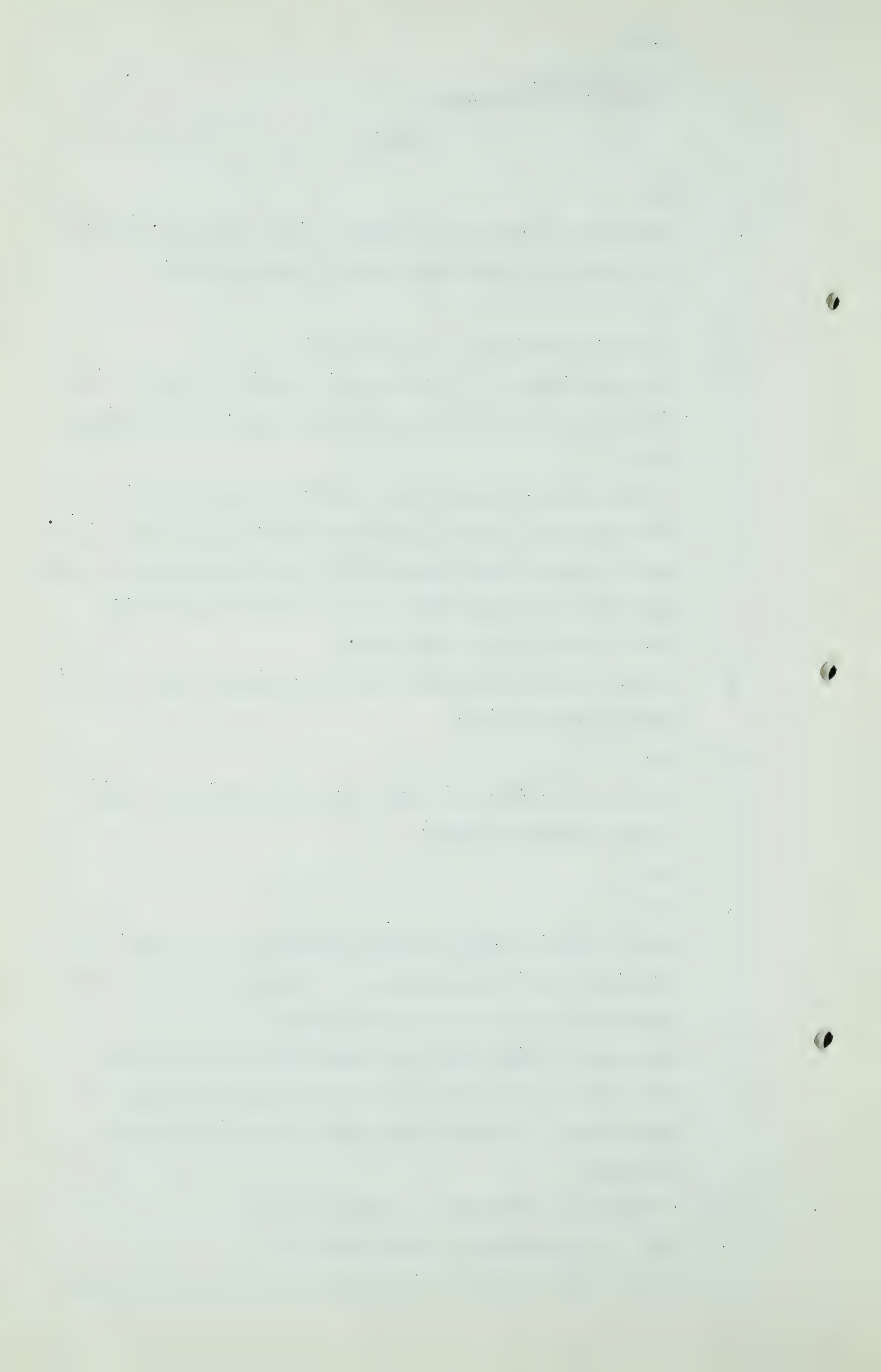
A No. I say it was balanced in the topographic map. In other words, I scaled it and added it in as I drew my route in.

Q So that it is absorbed in these figures?

A Yes, it is absorbed in these figures.

Q That is fine, thanks. I am sorry I missed that back and





D. S. Goodbody,  
Cr. Ex. by Mr. McDonald.

- 788 -

ahead. Let us go to Route B. As I take it, we start at Pincher Creek Station which is really your zero?

A Yes, it isn't shown on here. This was drawn on before the actual starting point was determined.

Q Yes?

A The end of the map was determined.

Q Yes. So that am I correct in saying that you start in with Pincher Creek as your zero point?

A Not Pincher Creek.

Q Pincher Creek Station?

A It is Pincher Creek Station. It is up closer to Brockett on here. I believe it is shown on here. I haven't taken the mileage on this strip map. This is close, and as far as I know there are no errors in the thing at all, but it merely, our calculations are not tied to this strip map, it is merely for use if you want to use it. It is not anything, no one would want to be tied down to any one particular line on this map, but it is an indication of where you propose to put the route and the way these notes are drawn.

Q Yes?

A What I do not want to do is for you to get and follow this map. It has no particular purpose, other than convenience, as far as I know.

Q It is a diagramatic presentation?

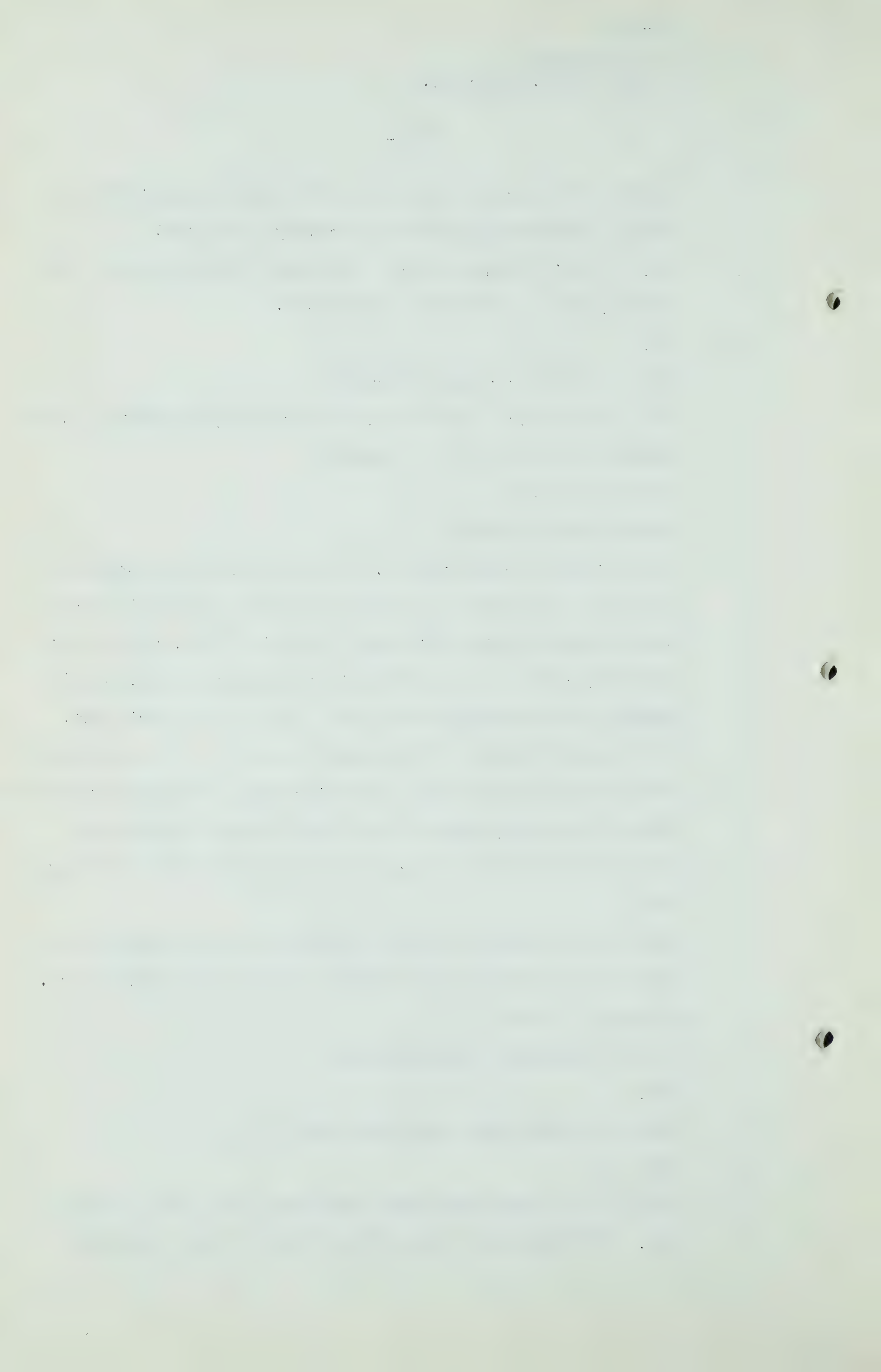
A Yes.

Q But it is taken from your base maps?

A Yes.

Q And it is on those maps that you have shown your scaling?

A Yes. We have taken them off the maps we have presented



D. S. Goodbody,  
Cr. Ex. by Mr. McDonald.

- 789 -

here.

Q Yes. Well, now, let us go through from C to B and we get to Bellevue. I do not see any notation here of additional deviation or percentage deviation for rough going in this Crow's Nest area, is that right?

A No, there is no deviation. I had for this area, from here down, I had those maps that are drawn 2 miles to the inch to scale from, and we got down to near Elko, let us say from a place called, well, from Elko to Morrissey, we used the speedometer reading in there. Those figures that are circled through this map are or were determined by that. Now, there is a page in here that you would be interested in. We found a pass to the north, that shows the line running by Crow's Nest Pass Lake, and we have found a pass to the north that we can get through. This present one is the one that the highway goes through and we found a pass to the north that we can get through without adding much distance, without being restricted on the highway. Our notes and everything were taken along the highway.

Q That is an alternative location?

A Yes, that is an alternative location, that comes up about a mile north from this present one. We thought it would be better to go up there rather than get into a restricted area.

Q And that is considerably north of Cranbrook?

A Crow's Nest.

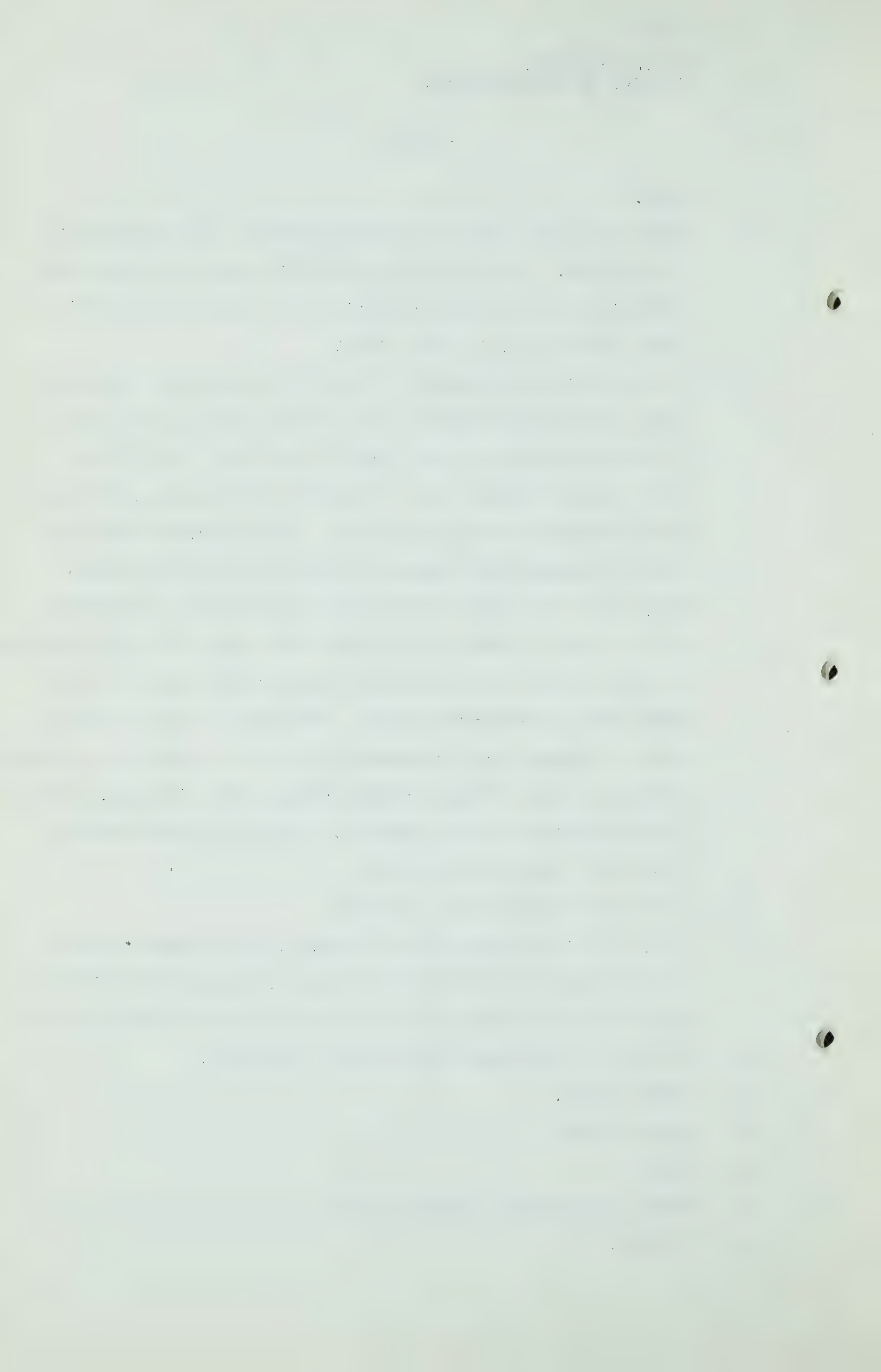
Q Crow's Nest?

A Yes.

Q What page were you reading from?

A C to B.





D. S. Goodbody,  
Cr. Ex. by Mr. McDonald.

- 790 -

Q C to B?

A Yes.

Q Oh, I am sorry. You mentioned that in your verbatim submission?

A Yes.

Q Will you turn to E to D?

A Yes.

Q You have an alternative location as between Peavine Creek and Wardner?

A Yes.

Q Which location have you used in your estimate?

A The notes are across from Wardner through the Pass, they run on the south line through there.

Q And that is the line that goes up towards the Inter-Provincial Highway to the crossing at Joseph Creek there?

A No, it is on the south. That piece was estimated on the south line, not on the north line.

Q Yes?

A The one line crosses through Gold Creek and Ha Ha Creek. It is on the dotted line there.

Q It is on the dotted line?

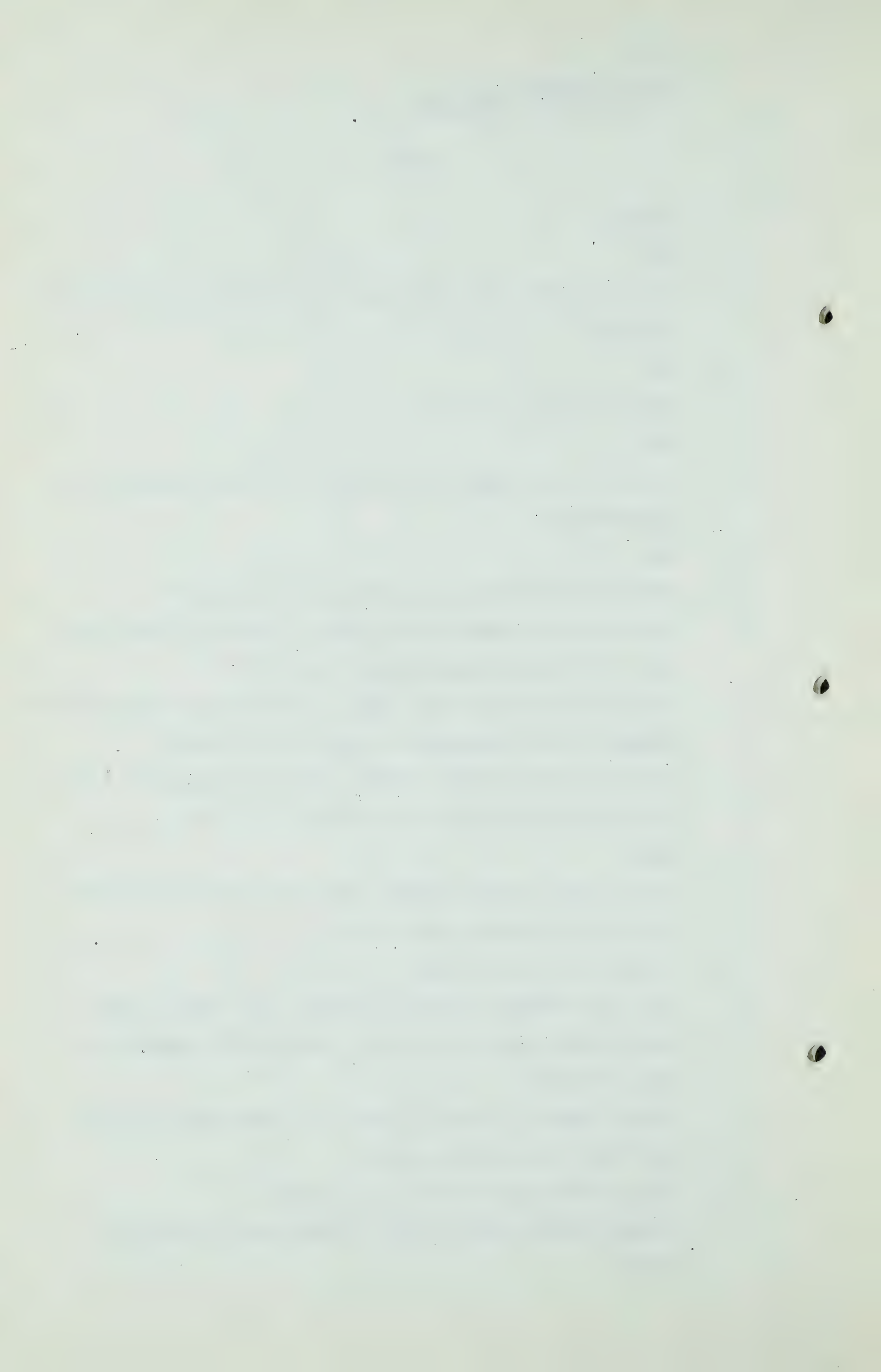
A Yes, our estimate is based on this line (indicating).

Q What is the elevation that you reach on that particular piece of line?

A I have taken all that off, and it is available on this, and I have provided for that.

Q It is fairly high in there, is it not?

A We get 4,000 or 3500 or 3800, something like that, in there.



D. S. Goodbody,  
Cr. Ex. by Mr. McDonald.

- 791 -

Q And is that good going?

A It is pretty tough from, we get over here, there is a place called Ha Ha Creek.

Q Yes?

A You get some rock and some side hill in there. You will notice in the text I say that it gets pretty rough and there is some limestone cuts across that flat there.

Q Have you added anything for deviation there over and above your 3%?

A No. This is scaled off from the 2 miles to the inch map, and this line runs straight up the canyon along the side hill. In my opinion it was not necessary to add anything.

Q But you go from a fairly low altitude to a fairly high altitude?

A 3% is added into everything. It has been added over the whole line, and over-all 3% is ample.

Q Yes?

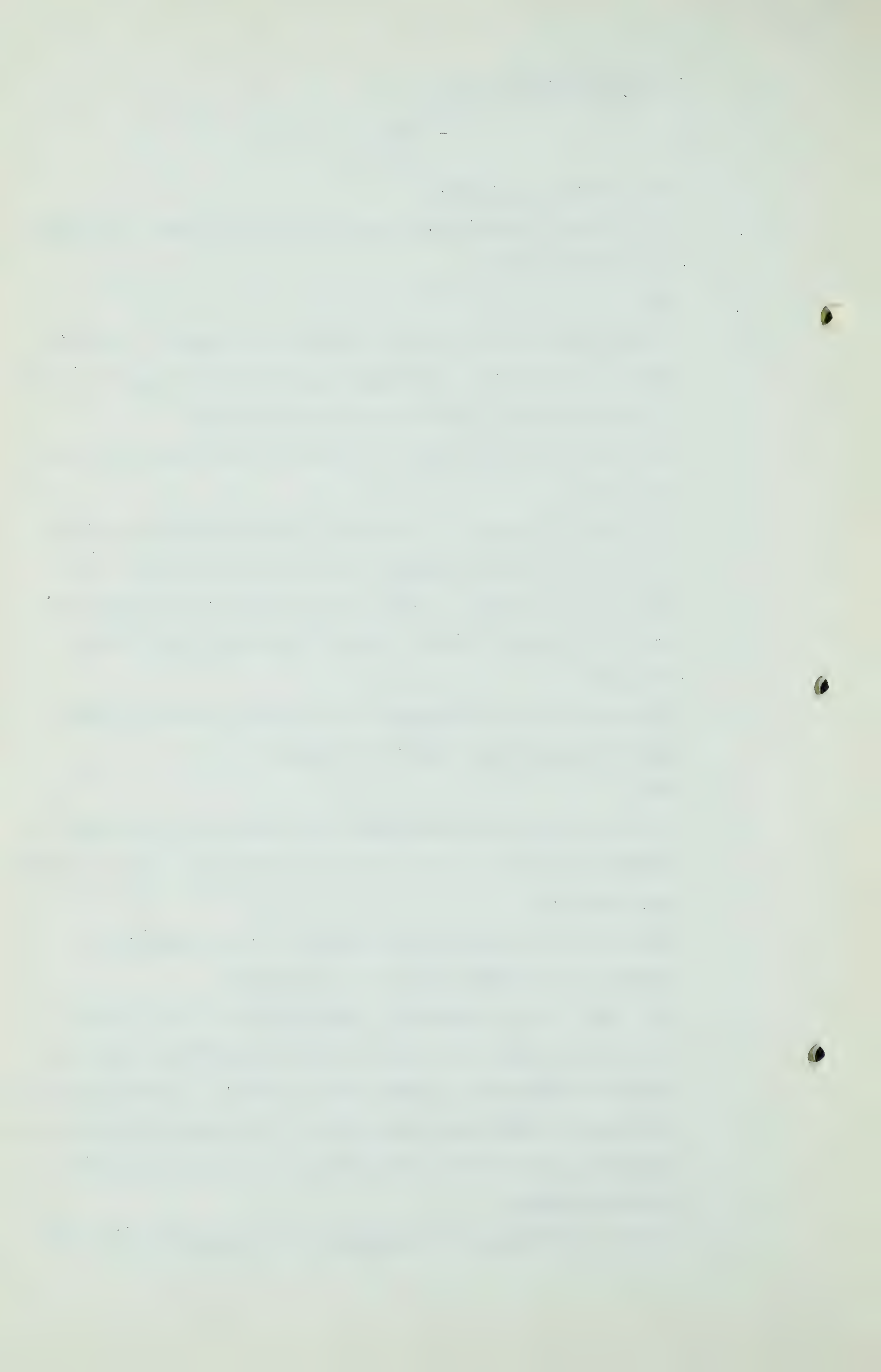
A The reason that the percentages are added in it is that the canyons are going to be so short in the other that we cannot draw them in.

Q Now did you add anything for deviation, any additional deviation as between Moyie and Kingsgate?

A No. That is all speedometer reading there. We followed the road the same as we did in the Allison Pass. We used the road mileage and I think that is ample. There is nothing in there for additional deviation. All those circled figures, wherever you see the circled figures, we have used the highway mileage.

Q So that from Pincher to Kingsgate you calculated it as 170





D. S. Goodbody,  
Cr. Ex. by Mr. McDonald.

- 792 -

miles, I take it, from your cost estimate?

A Yes.

Q And that is the accumulation of the figures you have given in your sectional description?

A I took those and added 3% to them.

Q You took those and added 3% to them?

A To those figures, and they should equal 170 miles.

Q If you take these and add 3% to them?

A Yes, they should equal 170 miles, and that is true of the entire thing. If you add 3% to any of the figures in any section that you want to check.

Q That was what was worrying me, because I have added them up and I get 170 miles and then I add up the same lengths in the United States and I get 633.2 miles, and I might say also that I have checked the scale lengths, and I arrived at 170 miles, and have checked the scale in the United States, and it is a little longer than your 633. Just let us deal with the Canadian line. I do not see where you have added the 3% deviation in Canada. That is what is worrying me.

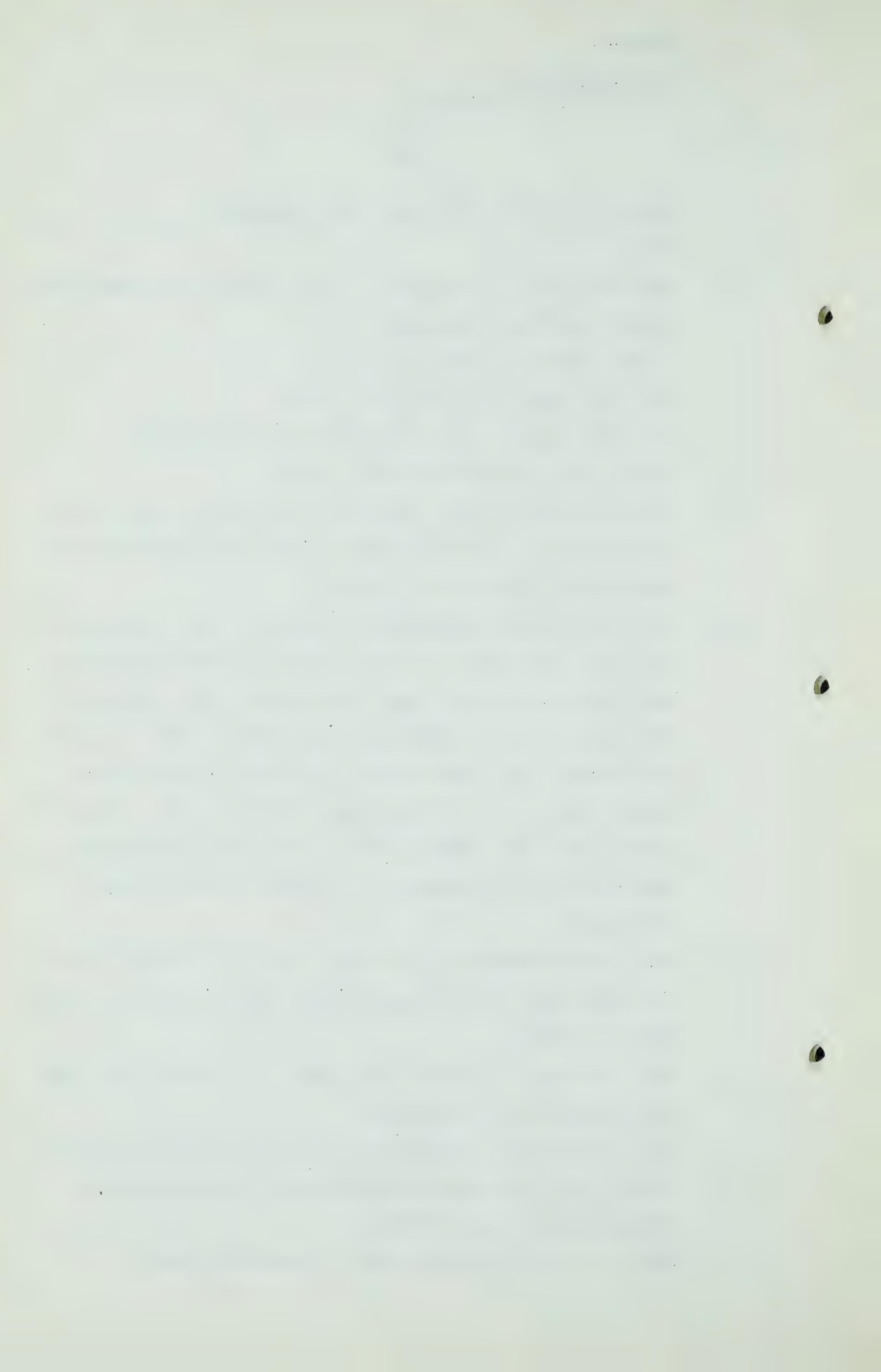
A Well, it is supposed to be there, and if it is not there it is my error, certainly, but that is my intention to have 3% on the scale.

Q Yes. So that if you have not added it, then you will have to amend your cost estimates?

A Yes, if it is not correct, why, we will take care of it.

Q I will tell you frankly, as far as my calculations are concerned, it is not there.

A Well, it is my intention that it should be there.



D. S. Goodbody,  
Cr. Ex. by Mr. McDonald.

- 793 -

Q Well, now, - -

MR. C. E. SMITH: Where is "there", for the benefit  
of the rest of us?

A The 170 miles between Pincher Creek Station and the border  
at Kingsgate.

Q MR. McDONALD: Yes, that is right. But on the  
same method of measurement in the United States you arrive  
at your 633.2 miles, and you add 3% and you get 652.1 miles,  
which is the amount that you used in your cost?

A Yes.

Q Now, I am just worried about this 25% that you added in  
this one particular section from Kootenay Creek in your  
Route A?

A Yes.

Q Now, why did you select 25%?

A Well, I do not know of any reason for not taking 25%. I  
do not know how in the world anybody would determine what  
the length of the line is actually going to end up at.

Q Yes.

A It is a figure, and anyone can check it, and take his  
choice after going up through that Valley.

Q Now, why did you select 3% for the over-all?

A I think that is ample. I have added 3% to both Route A and  
Route B.

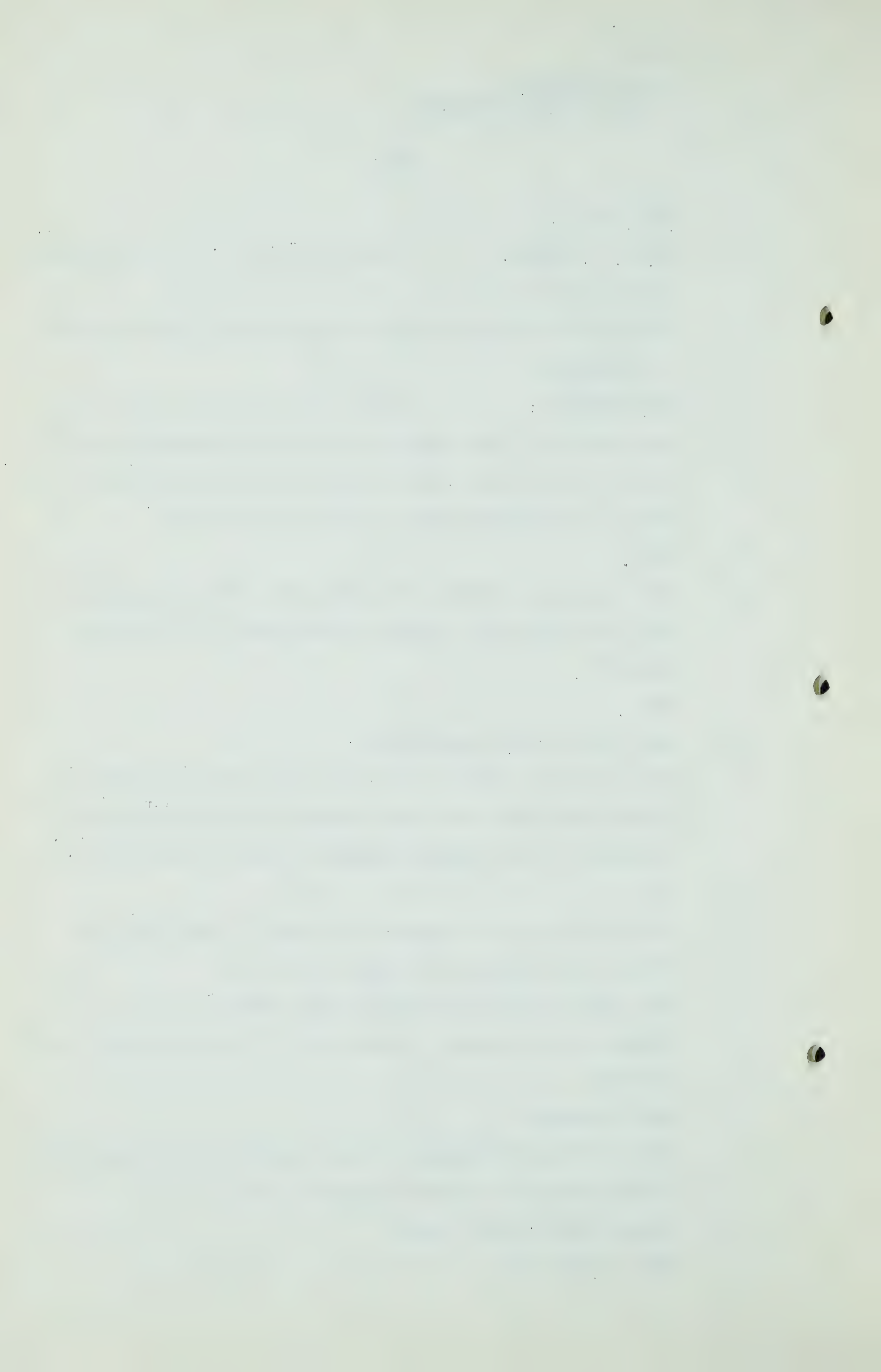
Q That is right. .

A And I selected 3% because in my experience it is there for  
to take care of deviation along the line.

Q Along a line of that size?

A Yes, I think so.





D. S. Goodbody,  
Cr. Ex. by Mr. McDonald.

- 794 -

Q Where did you get that experience in connection with your particular type of construction, was it water line?

A Pipe line. A pipe line that is put up and down hill and goes across country, why it is an allowance that we have made and I think it is ample to take care of it.

Q Do you know, if you do not know tell us, have you any idea what similar deviation factor has been added to long distance pipe line estimates, to scaled mileages, in the United States for similar lines?

A No, I do not know what they do. I think it is a matter of opinion, the opinion of people who do the work.

Q Now, if someone was building a thousand mile pipe line through a number of States, through various types of country, which, I presume, essentially is rough country, as you have described here, do you know what they would add?

A Well, it would depend entirely upon the deviation in the line. I think you can check the testimony of your own people and find out a pretty good answer for that. I have known it to run to less than 1 and over 3 or 4 or something like that.

Q Yes?

A It will depend entirely on the type of country they are going through.

Q Yes?

A And I might be 1% wrong on the 3 but I would say that the 1% would either be up or down.

Q There is just one thought here, Mr. Goodbody, we will go back to this Item E-D on Exhibit 18?

A Which one is that?

Q That is North of Cranbrook, the cut-off?

A Yes, fine.



D. S. Goodbody,  
Cr. Ex. by Mr. McDonald.

- 795 -

Q What are the factors, the conveniences for accessibility of that particular location?

A Which one now?

Q That is from E to D?

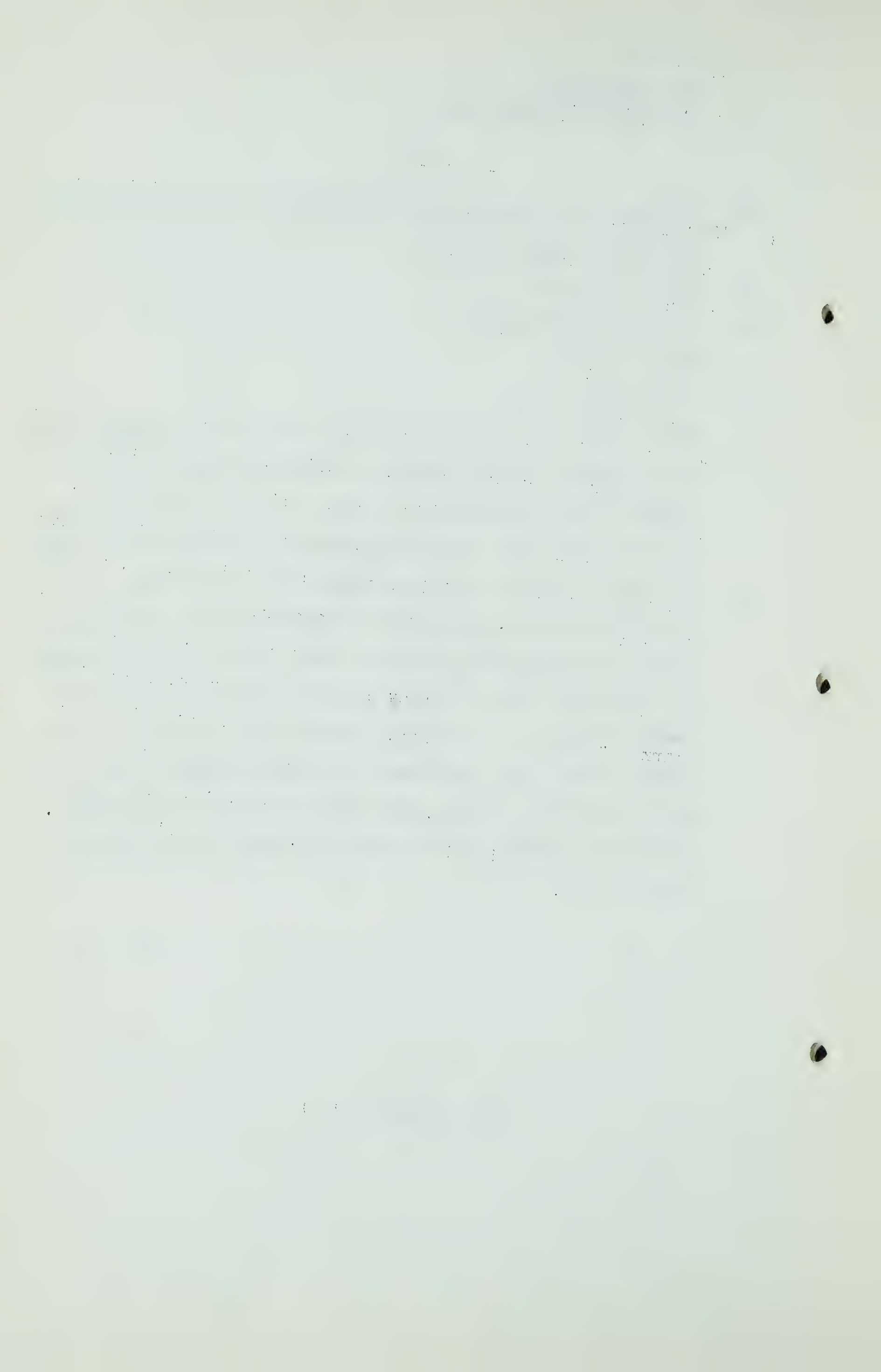
A From E to D?

Q Yes, from E to D?

A Well there is a road runs up the, through this Peavine Creek, the highway is about 3 miles, I believe, from this point at Peavine Creek, and there is a road coming up that valley, and then there is a road follows on up and goes almost right through. There is a hill up there but it is a road, and it is travelled and it goes into Cranbrook, over a fairly good grade and then there is another road comes out of Cranbrook on the other side and along down to Gold Creek, which is marked "creek" on this map, a market road, which is a road some 18 feet wide, and there is a branch takes off and comes up in about the middle, where the arrow hits, where the alternate selection is on the side, right by  $115^{\circ}$  and  $30'$  and  $49^{\circ}$   $25'$ .

(Go to Page 796)





D. S. Goodbody,  
Cr. Ex. by Mr. D.P. McDonald.

- 796 -

Q Are those roads that will be kept open in the wintertime?

A One road will be kept open in the winter time, the one coming down Gold Creek, and of course, there is the inter-Provincial Highway on both sides of it. It comes right around the loop and hits off. It is kept open.

Q With regard to the weather in this particular Crow's Nest area, have you obtained figures on the snowfall?

A I have some figures on the snowfall. They are very, very inadequate to do much with because they are only a few years at Blairmore and the weather varies so rapidly from one place to another in there.

Q The snowfall is sufficient to prevent transportation of any kind at times, is it not?

A It piles up quite high. This last year I understand they had to stop at Fernie.

Q And it is particularly applicable to highway transportation every year, two or three times a year transportation is halted? You know, or don't you know of that?

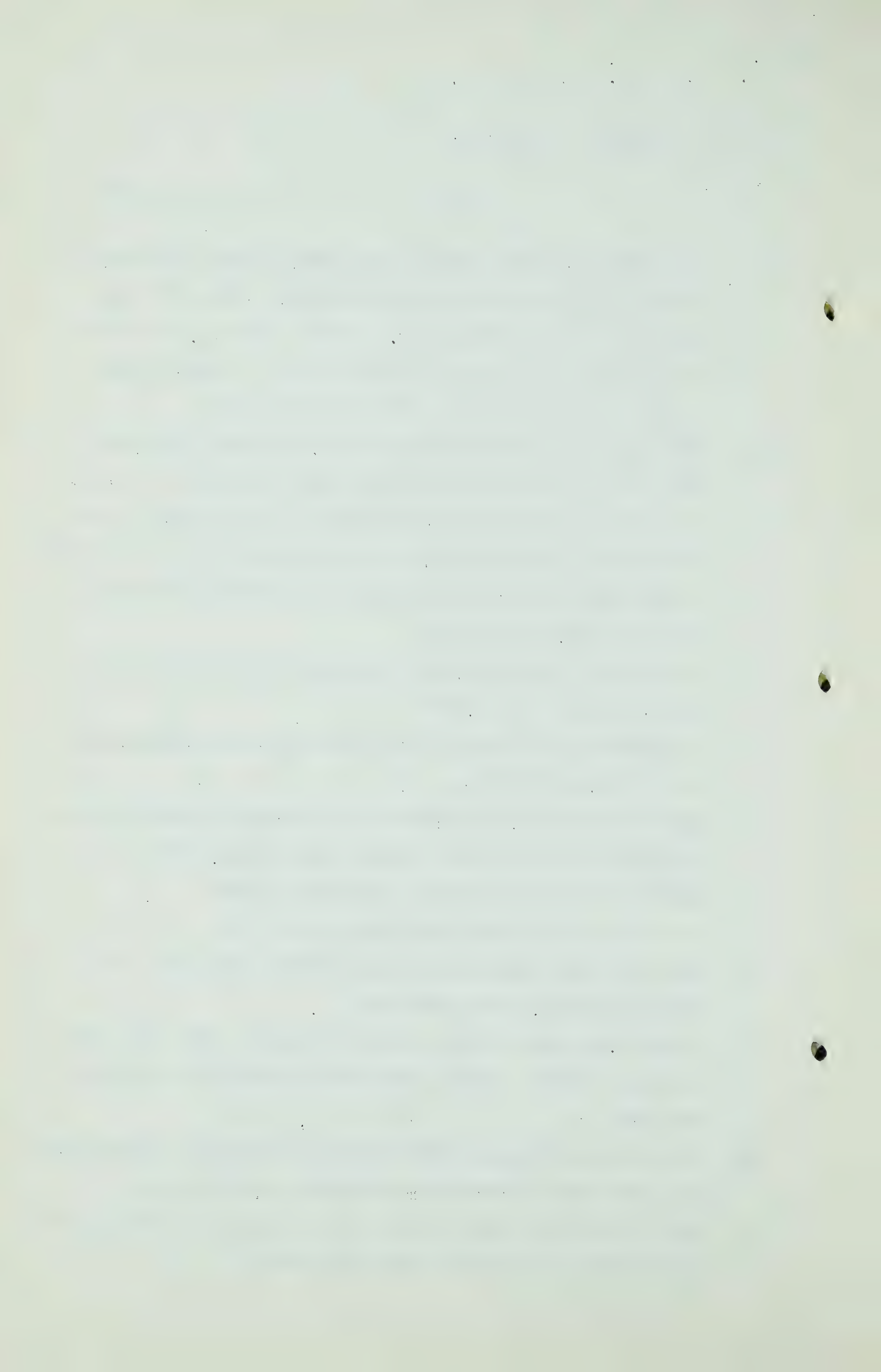
A I do not know the particular history of that.

Q Does the same thing apply to the Stevens Pass area, the highway blocked there sometimes?

A On the west side it gets blocked up there. They were tied up there a week, I think, last year, a week and a half at one time.

Q In fact, all these mountain passes are subject to practically the same types of weather conditions, are they not?

A Yes, I think so, when you get up to a certain elevation you expect those conditions almost any place.



D. S. Goodbody,  
Cr. Ex. by Mr. D.P. McDonald.

- 797 -

Q Just one thought about the abandoned tunnel you are using on the Stevens Pass. Do you know why the tunnel was abandoned by the Great Northern Railway?

A Well, it is pretty high up in the mountains. I do not know if there is another reason, they could not get enough freight up over the top of the mountain through the tunnel. Its economical use. The maintenance on the approach on the west side was very high. They had to stick up on that shelf on the highway. The maintenance of those sheds and the clearance of those lines were quite high.

Q Wasn't it because of the cost of maintaining snow sheds?

A That is what I said.

Q And those snow sheds are on both sides of the Pass?

A No.

Q Not on the east?

A Not on the east side. And they are high up on the sidehill, you see. Our line is away from those snow sheds. We swing out the end of the tunnel to the other part of the valley. That State highway runs down and stays down to the flatter bottom and we are on the old State highway down through there.

Q What working season did you have in mind on Route B particularly? Can you give us the data in regard to that?

A Well, some places some work can be carried on year round and other work - - I think more than likely we would be shut down on practically all of it for two months in the wintertime. We can work from at least February, the 1st of February, on Route B except right in the Stevens Pass area. From the 1st of February until the 15th of December, I believe, on





D. S. Goodbody,  
Cr. Ex. by Mr. D.P. McDonald.

- 798 -

most of it.

Q Now, you have a reference in your data here?

A It is in Route A. You are looking for my mention of the season? It is on Route A and I said that more than likely we would take an extra season. That is due as much to the rough country in that area as it is to the weather conditions. Of course, it gets up quite high and you are going to have a very short winter season on the high points there.

Q Well now, would you leave that and deal with this matter. You have a reference to initial investment in compressors. I take it that your costs are all included in this estimate and based on design of pipeline given to you by your clients?

A Given to me.

Q I think, sir, it is part of the cost system on design of pipeline. Could you have this marked now?

MR. NOLAN: No.

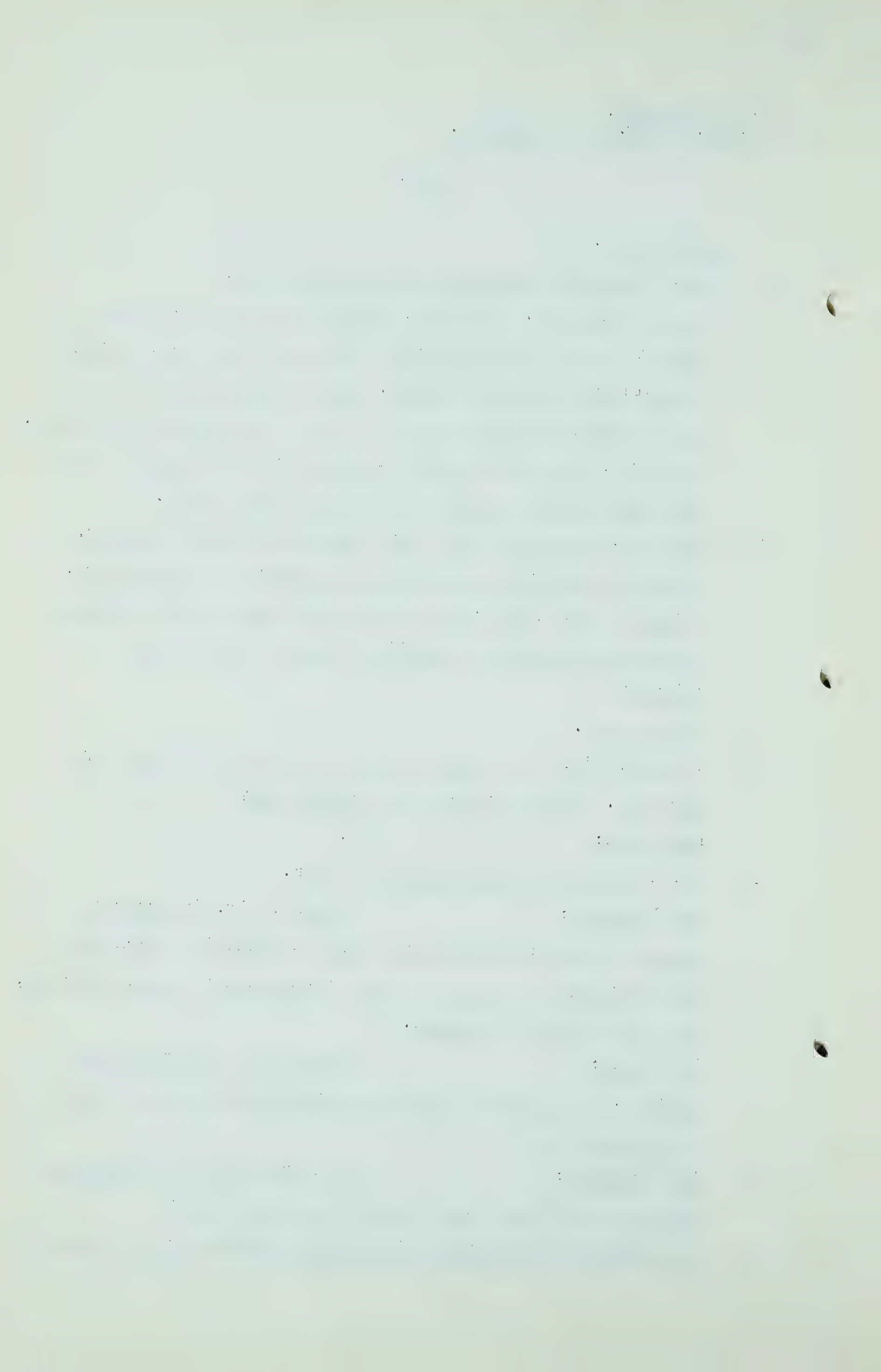
A No, I do not know anything about them.

MR. McDONALD: I submit, sir, in order to design a pipeline as set up in the two exhibits which have been furnished us on part of the presentation of this witness, that they should be marked.

MR. NOLAN: I will have it marked as an exhibit, sir, when the time comes and the witness is there to identify it.

Q MR. McDONALD: Well, what were you furnished with by your client upon which to estimate this?

A We were given the number of horsepower that would be required



D. S. Goodbody,  
Cr. Ex. by Mr. D.P. McDonald.

- 799 -

for compressors.

Q And were you given the locations of the compressors on the line?

A Yes, the approximate locations.

Q The fact as to where the compressors are located is part of your estimate of costs?

A No, I used the same rate for horsepower on all of them.

Q There was one thing you were mentioning, Mr. Goodbody, and that was the question of moving on highways. I think you told me that you would have to adjust loads of your trucks to the capacity of the particular highway you were moving over. Is that not so?

A Surely.

Q I was just wondering, you said that and I was wondering what you meant by your evidence in answer to Mr. Nolan some days ago or the other day in which you referred to the fact it might be prohibitive to move material over the Hope to Princeton highway. What did you mean?

A Well, it might be prohibitive for the time of year, it might shorten your working season. I don't know what is going to happen on that highway.

Q What would be the heaviest machinery you would move on the highway?

A Oh, I think we would more than likely go in there with about 30 tons, between 30 and 40.

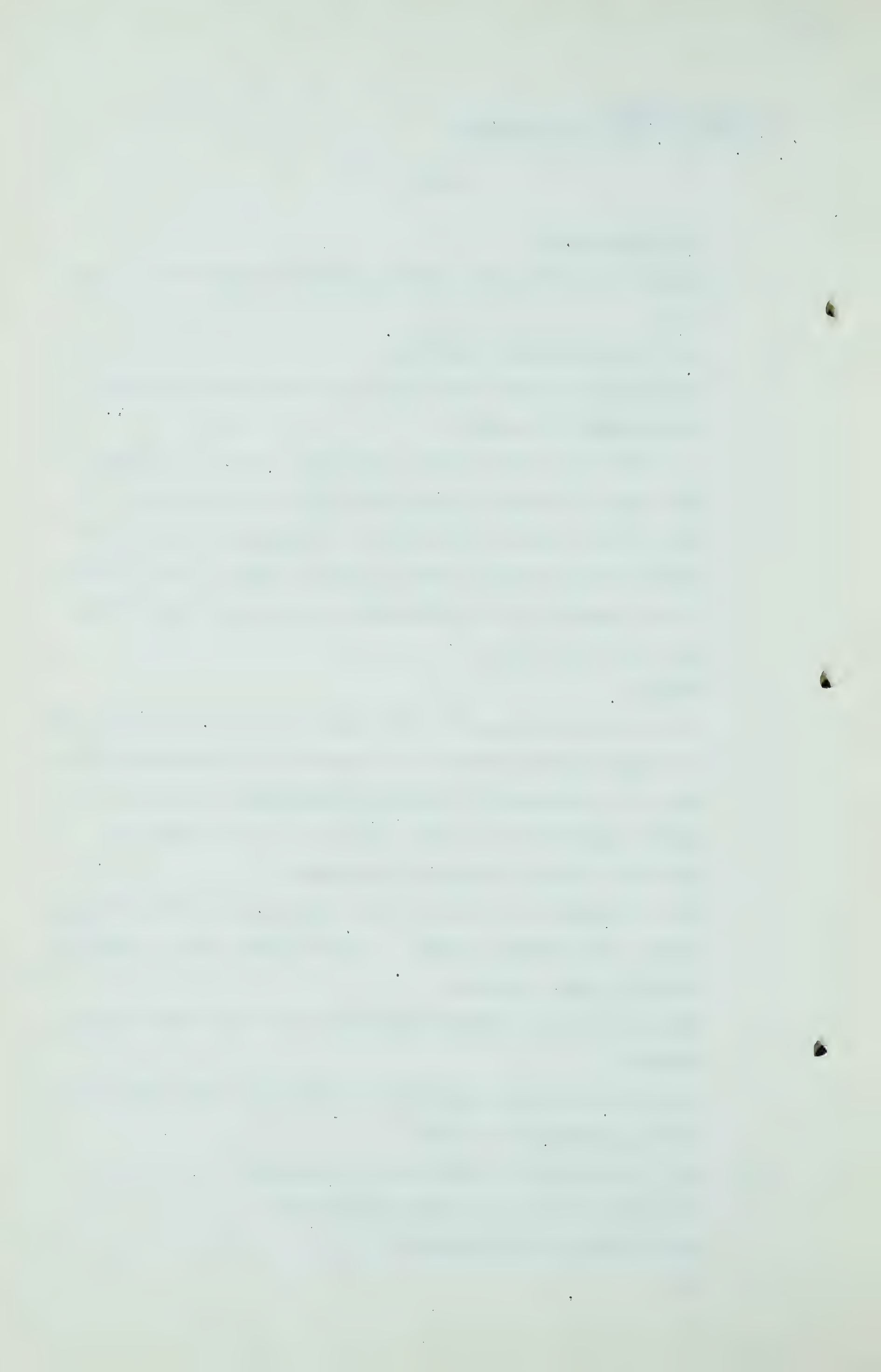
Q Now, would that be comprised of your pipe?

A No, that would be your heavy equipment.

Q And it would be on trailers?

A Yes.





D. S. Goodbody,  
Cr. Ex. by Mr. D.P. McDonald.

- 800 -

Q And they would be multiple-wheeled trailers?

A Yes.

Q So I take it you do not anticipate any trouble in working in the Hope to Princeton area?

A If I were working up in there I would certainly anticipate doing some damage to the highway.

Q I am looking for a calculation I have here, I am sorry. I just want to refer you to the map back of Exhibit 14, of A. Now, in this map you do not show your lateral from the main line to Hanford?

A That is correct.

Q You have eliminated that. Now, can you tell me, or if not, tell me . would it be fair to apply your scale of miles as shown on your map to the distance from the main line at Brideville or Osoyoos to Hanford? Do you know how far it is?

A No, I do not know how far it is.

Q I have scaled it and it comes to about 170 miles. I was wondering if you would agree with me on that.

A How much did you say?

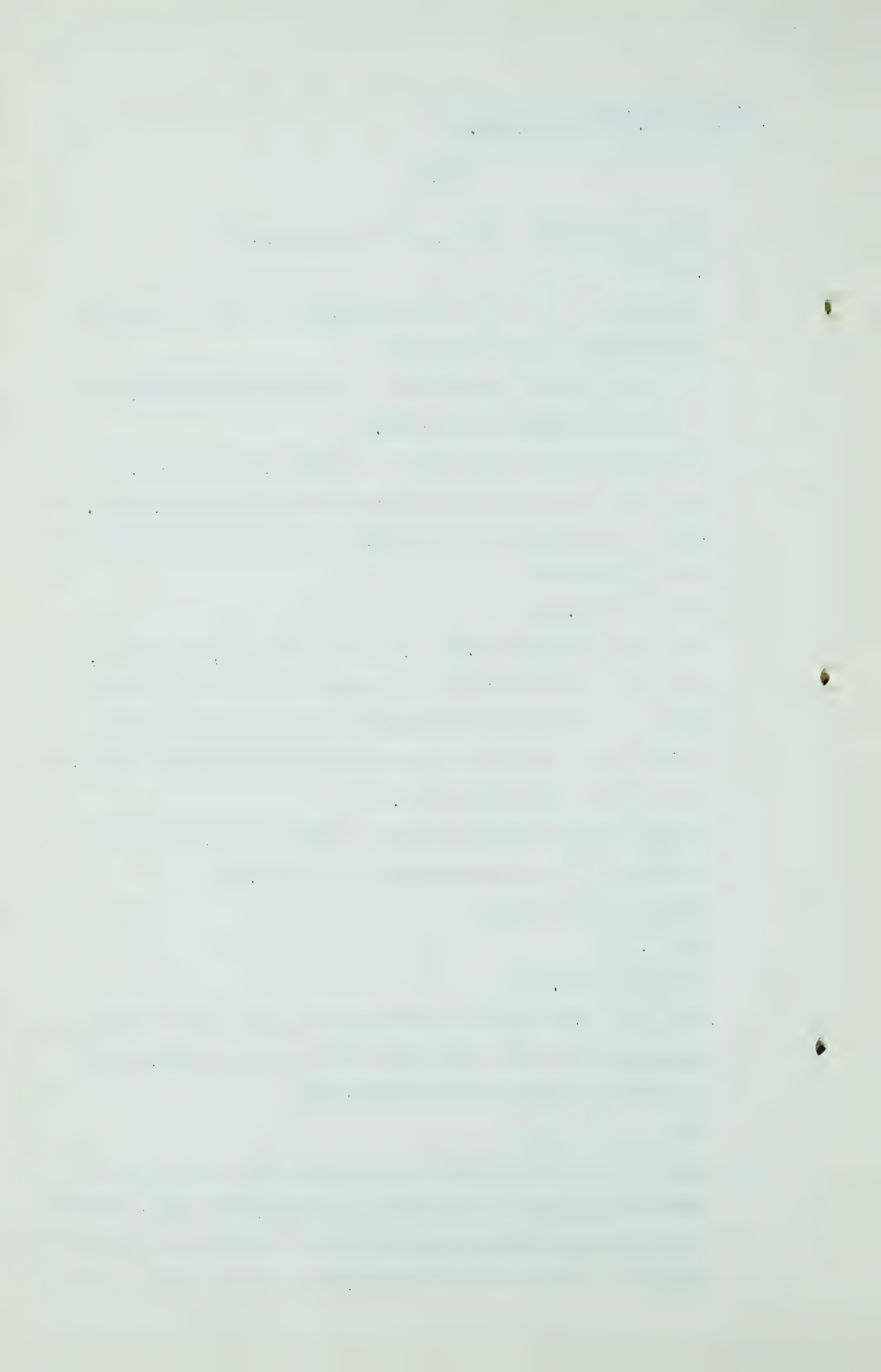
Q About 170.

A I will go for 180.

Q 180, yes. Now I take it from what you have told me that in preparing your costs for this Route A you were instructed to leave out this lateral to Hanford?

A Yes.

Q Now, I did refer before the intermission to this Route B map which you have at the back of Exhibit 15, and I referred you to the map which you presented to the House of Commons Committee on Railroad Transportation, and you told me that



D. S. Goodbody,  
Cr. Ex. by Mr. McDonald.  
Cr. Ex. by Mr. Mahaffy.

- 801 -

the mileage was set out in that map. Would you look at it and tell me whether that is the map and whether the main is 930 or not?

MR. NOLAN: Just a moment until I find out what this is, where it came from, and what is supposed to be done with it. I am not going to have these proceedings here, if I have my way, involved in any discussion that took place in Ottawa or any place else. This is our application being heard here in Alberta. I think we should keep it to the evidence relative to the purpose for which we have all come here, and certainly any evidence that is introduced anywhere else by somebody else is not proper evidence to be adduced from this witness.

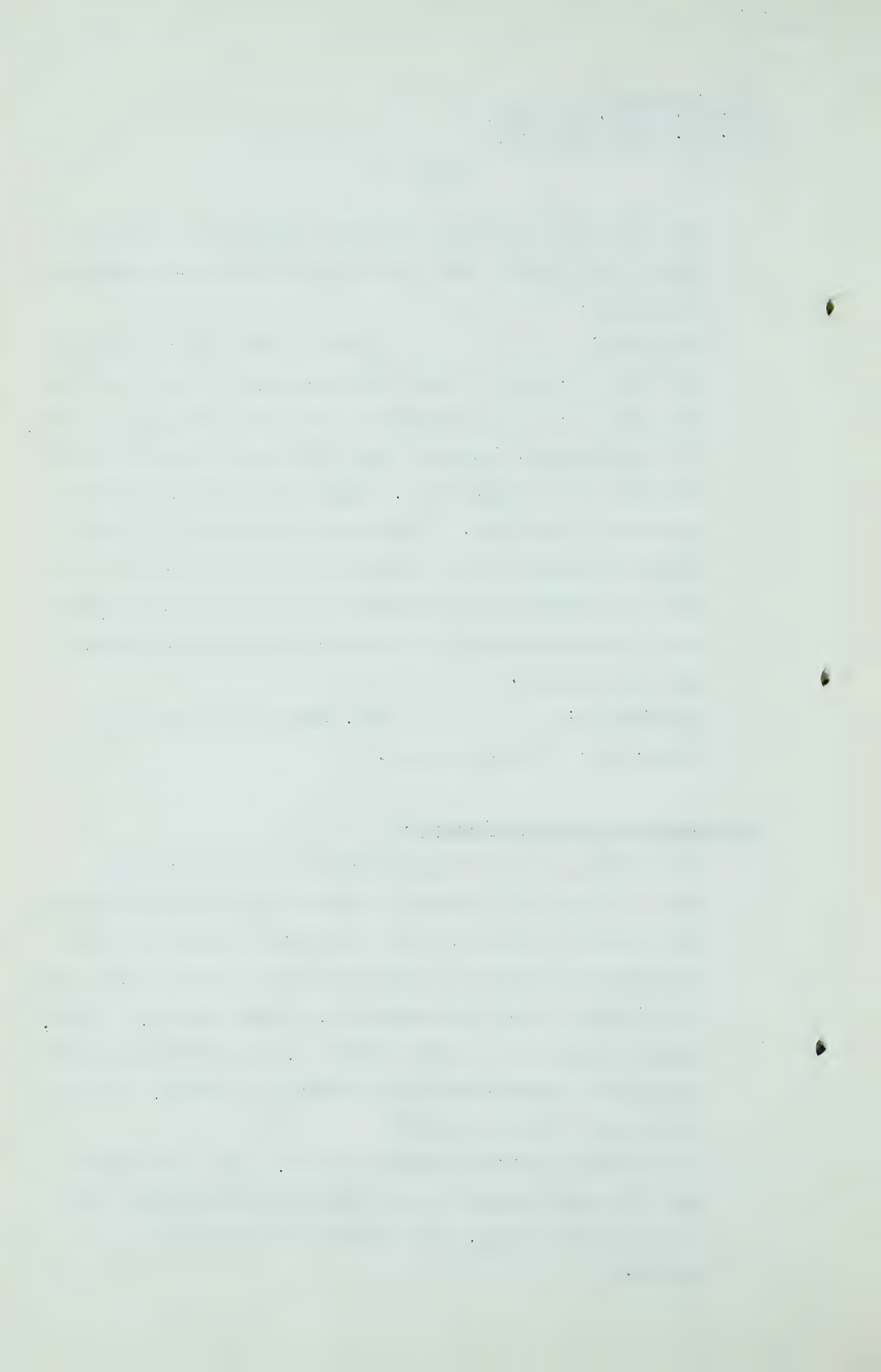
MR. McDONALD: Mr. Dixon introduced it in Ottawa, sir. I will leave it.

CROSS-EXAMINATION BY MR. MAHAFFY:

Q Mr. Goodbody, I am more particularly interested in the portion of your brief dealing with the pipeline system within the Province of Alberta, and I would like to ask you just a few questions to obtain information with respect to that part of your line. Now, take Exhibit 15, it matters not, I guess, whether it is 14 or 15, but Exhibit 15, your first map shows the pipeline system within the Province of Alberta. Did you go over this route yourself?

A I have flown over practically all of it, and I have been over it on the ground, oh, out east of Lethbridge and then as far here as Calgary, and I have flown up as far as Edmonton.





D. S. Goodbody,  
Cr. Ex. by Mr. Mahaffy.

- 802 -

Q You have been on the ground, the destination being in an aeroplane from Calgary and pretty well south?

A I would say I am quite familiar with the country south of Calgary and over beyond Lethbridge.

Q And then you have flown from Calgary to Edmonton?

A To Edmonton.

Q And you have not been over the part from Edmonton north?

A No, I have not been over that part of the map.

Q Now, have any of your associates done that work for you?

A No. Frankly, the country shown was so flat on the topographic map that I was not terribly concerned about it.

Q And you are prepared, as you said earlier this morning, to take on this 27 or 28 million contract without any further investigation?

A Well, I am not concerned about that line up in there at all, that is right.

Q Would you consider this a preliminary figure or would you, as you said this morning, take on that contract without further to-do about it?

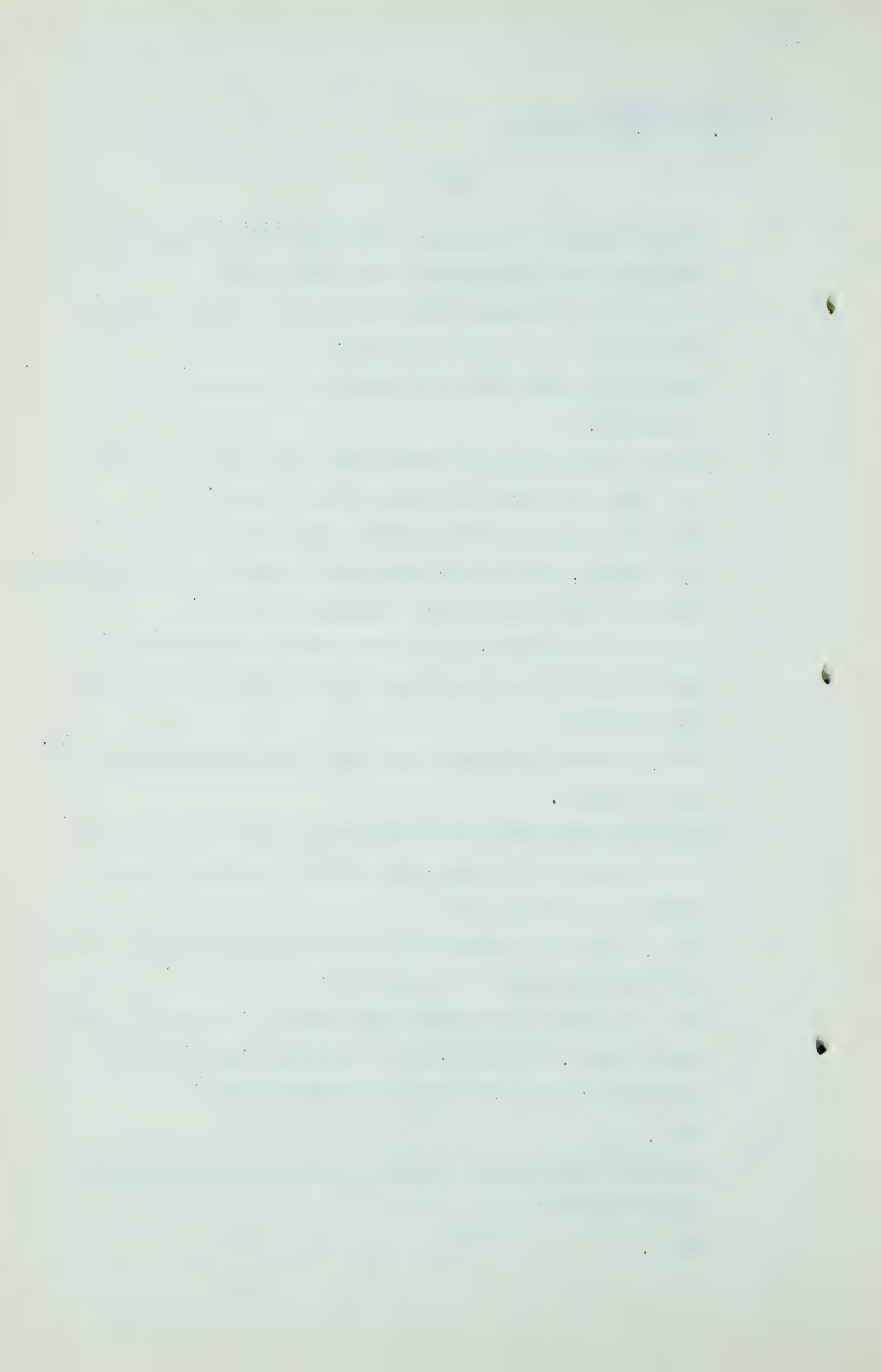
A Well, I might be surprised when I got up in there but I would not be worried about it right now.

Q Now, in connection with the same exhibit, I think it is the second page, is it not, of the schedules, yes. This is entitled "Route B, Alberta Natural Gas Grid"?

A Yes.

Q Estimated Construction Costs. I think the following page deals with it?

A Yes.



D. S. Goodbody,  
Cr. Ex. by Mr. Mahaffy.

- 803 -

Q Now how did you arrive at your figure for right-of-way and damages?

A It is merely an allowance that we set in there.

Q I mean, how did you get at it? It is a lump figure?

A It is a lump figure.

Q \$600.00 a mile?

A I have used the same figure all the way through, developed it from what I thought the land was worth and what I thought it would cost to get the right-of-way, and this is the same figure here.

Q Did you make any enquiries about the value of farm lands in Alberta?

A No, This does not anticipate taking over any farm lands.

Q Where do you anticipate running the line?

A Under the ground and turning it back to the farmer. I do not mean to be facetious, pardon me, but we do get it down deep enough and it goes right back to the farmer, there is no indication on the surface.

Q But you still have to obtain your right-of-way from Mr. Farmer?

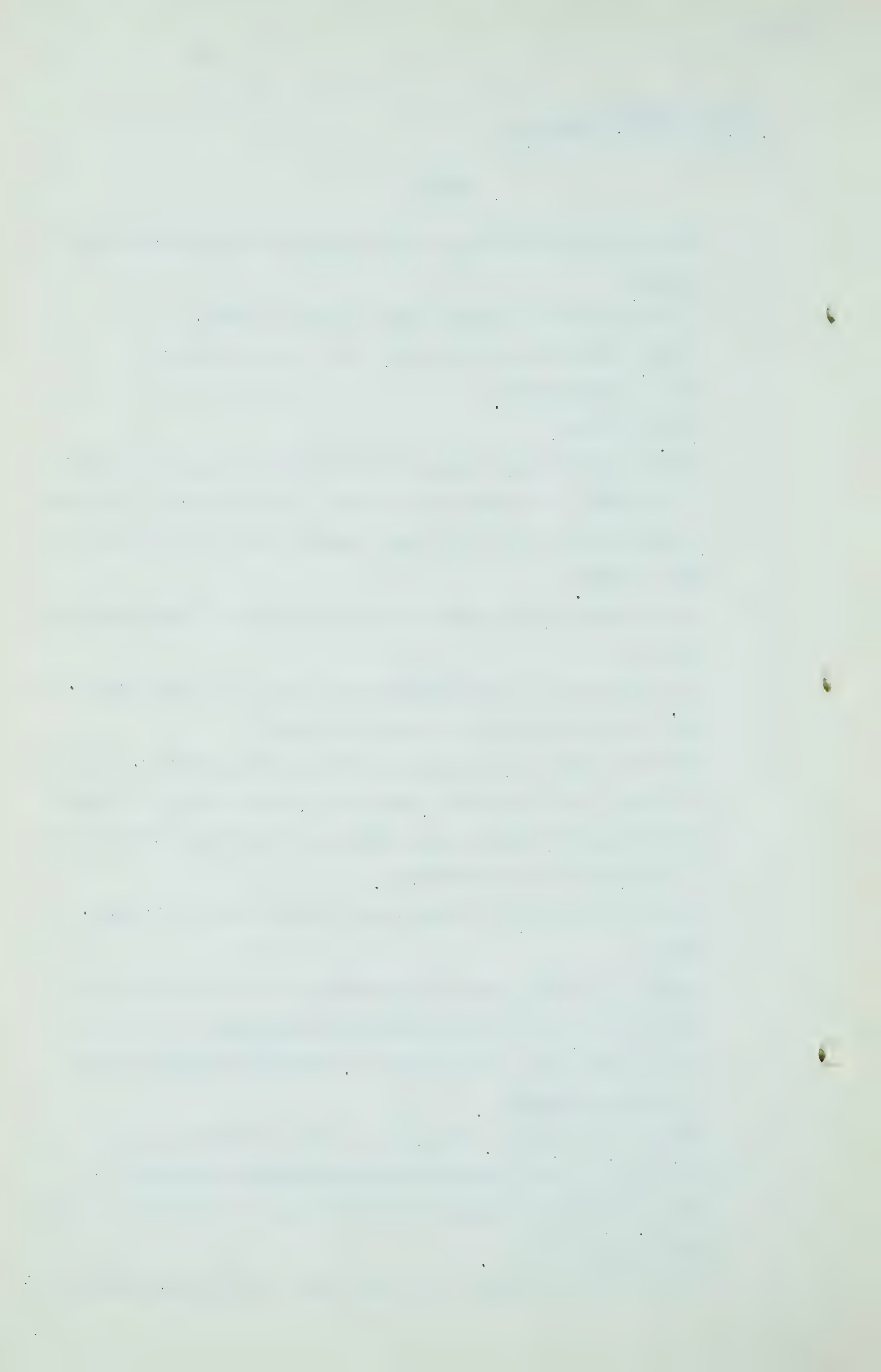
A You have to obtain your right-of-way from the farmer and undoubtedly if you went in there and destroyed a crop you would have to pay for the crop. You would certainly have to pay his damages.

Q Anyway, your \$600.00 per unit is just a figure you have pulled out of the air and it is strictly an estimate?

A Yes. We are not trying to set the price on anything by that particular figure.

Q Is this the same figure you have used in the United States?





D. S. Goodbody,  
Cr. Ex. by Mr. Mahaffy.

- 804 -

A It is the same figure we used right straight through everything.

Q And in the mountainous areas?

A Yes, an average figure we have used all the way through. There is some of the land down below, a lot of the State tax land we are going through that I do not anticipate any costs at all other than the trouble of going to the State and getting permits.

Q Getting permits. Now, on this same page I wanted to get this straightened out, if I may. As I understand the figures on pipe under the heading "Materials", you show various pipe requirements and the total of the pipe requirements is 71,276. That would be tons, wouldn't it?

A 71,000 tons.

Q 71,276 tons?

A Well, I have not added this up.

Q Well, assuming my addition is right?

A I will assume you are right.

Q Then what I do not understand is why you only have freight on 46,852 tons.

A I am going to have to dig that out of my working papers for you for that. I do not know offhand, I do not remember it.

Q The 64,000 may be a typographical error but I wonder now if the three million and a half dollar figure is correct, you see?

A Well, I would assume the figure is correct. I think there is a reason for it but I have forgotten now. We have done an awful lot of work on this and I cannot remember the details.



D. S. Goodbody,  
Cr. Ex. by Mr. Mahaffy.

- 805 -

There is more than likely a reason that can be explained for that but I do not remember it.

Q Will you dig it out?

A It will be produced when we come to it later.

Q Now, moving over to the next page, Mr. Goodbody, you have estimated here a cost of building the desulphurization and dehydration plants. These, I take it, come within your general statement that you are prepared to do this work for the prices that are set out?

A Those are allowances that are made. We are not certain that the plant will have to be built by us. They have been included in this particular piece of work and these figures were given me on a foot basis, that is, so many cubic feet, The station will handle so many cubic feet at so much a cubic foot.

Q Now, will you tell me where that desulphurization plant will be located?

A That location, as far as I know, is anticipated at Jumping Pound.

Q Jumping Pound. And what throughput have you made this estimate on?

A I do not remember what it was. That will have to come out along with the other units.

Q Any idea at all?

A No, I don't remember.

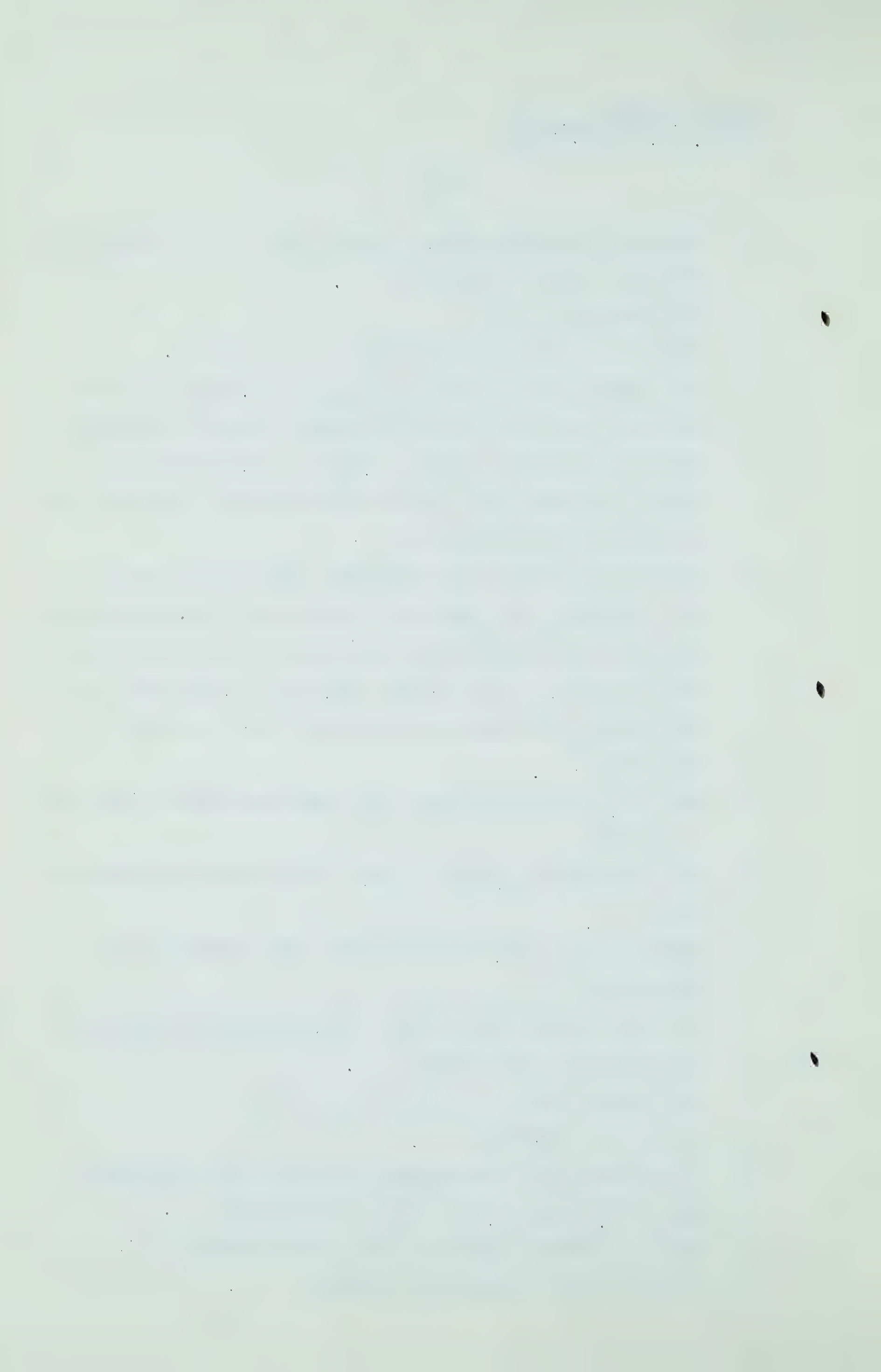
Q Is that the only desulphurization plant that is planned?

A Yes. That is, as far as this is concerned.

Q How do you mean, "as far as this is concerned"?

A As far as this estimate is concerned.





D; S. Goodbody,  
Cr. Ex. by Mr. Mahaffy.

- 806 -

Q Is there any desulphurization plant anywhere else in the estimate?

A No. I say, as far as this estimate is concerned, that is the only place.

Q And it is at Jumping Pound?

A Yes.

Q And you will let me have, and let the Board have, the throughput?

A I will have the unit and the throughput, yes.

Q Now, what was your scheme for the handling of the output of that desulphurization plant?

A I have not designed anything for it.

Q Are you going to throw the output to the atmosphere or what?

A I do not know anything about the design of the desulphurization plant.

Q You do not know anything about that?

A No, sir.

Q Well, just how is this desulphurization plant handled? Were you just told to put in two million dollars for that item?

A Make an allowance for it, yes.

Q Were you given a figure?

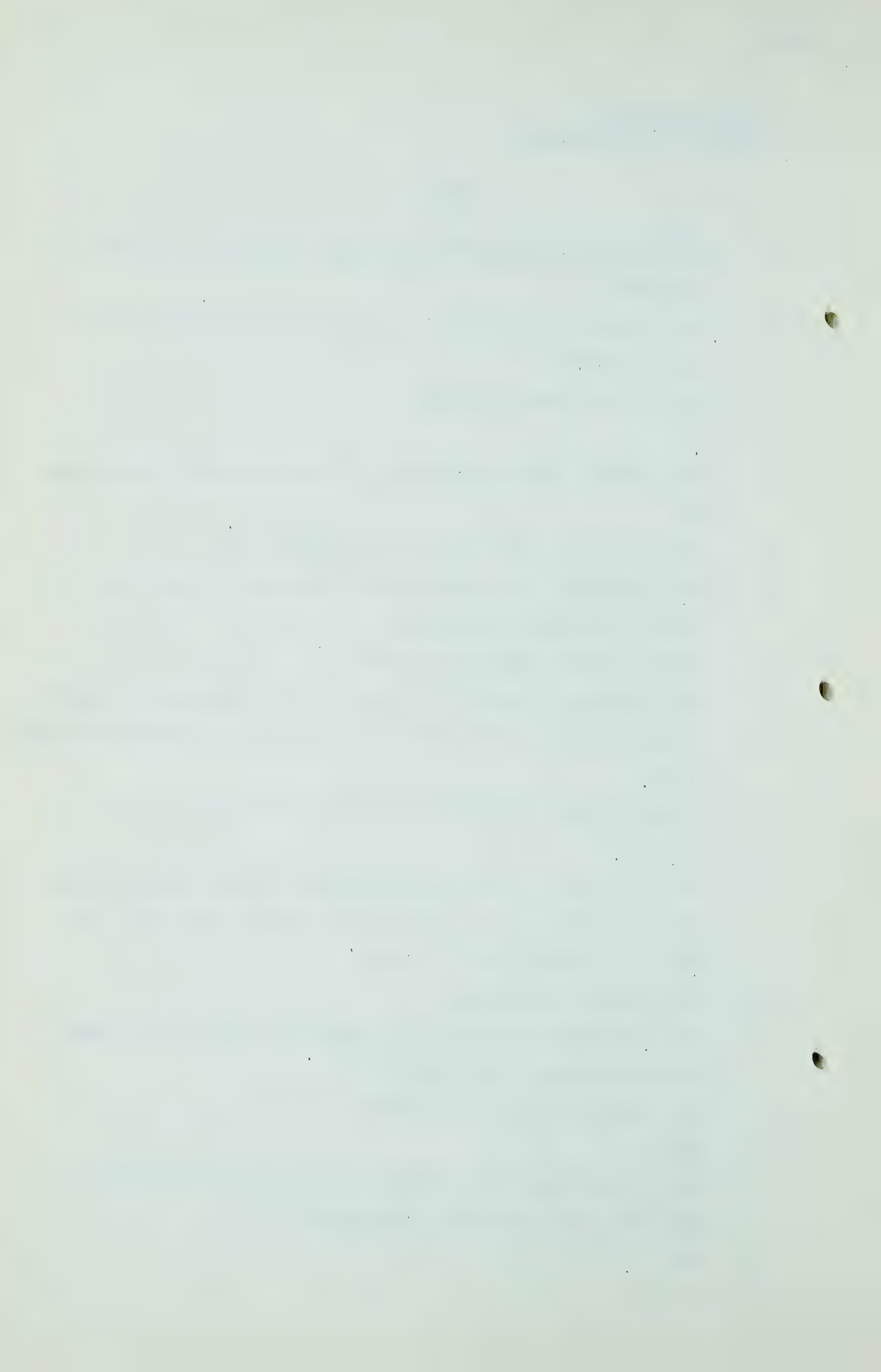
A Yes, an engineer gave me the figure and I put it in there as being ample to take care of it.

Q An engineer for the applicant?

A Yes.

Q And he just handed you two million dollars for that item and said, "That goes in," is that it?

A Yes.



D. S. Goodbody,  
Cr. Ex. by Mr. Mahaffy.

- 807 -

Q Now, where are the dehydration plants?

A I do not know where those are located.

Q Does that same thing apply to those plants?

A Yes, the same thing applies to those plants.

Q You were just handed this figure?

A Yes, the same thing applies. I will bring you in the unit.

Q Let me understand this, are you prepared to take a contract and build these plants at those figures?

A I think that my information for the source of these figures is sufficiently reliable so that I can say yes.

MR. NOLAN: I might say, Mr. Mahaffy, we do intend to discuss those two items of desulphurization and dehydration through another witness, and I am not suggesting you should stop asking these questions but we will tell you much more about it later on.

Q MR. MAHAFFY: Now, another question dealing with the whole statement, Mr. Goodbody, that I just want to be sure of. All of these figures are American funds, are they not?

A Yes, I tried to make that clear, they are all American funds.

Q I just wanted to make sure of it.

A Yes, everything in here is American funds.

Q So that all of this estimate, the particular one I am discussing with you, since it covers construction in Alberta, would be subject to the exchange, whatever it might be?

A Yes, it would be subject to the exchange.

Q To the extent?

A To the extent that the prices are not affected by the exchange. You would get into a lot of difficulty if you tried to break it down any other way.





D.S. Goodbody,  
Cr. Ex. by Mr. Mahaffy

- 808 -

Q Now, another item on page 1, under the heading "Access Roads", you have allowed nothing for that at all. Will you explain that to me?

A Oh, I think from the map that I have here the access would be right along the pipeline where we were delivering, and there would not be any what we call access roads needed to get into the right-of-way. I do not think we would have any difficulty there.

Q Have you ever tried to travel on some of our Alberta roads in wet weather?

A Yes, I have travelled over some of your Alberta roads in wet weather and I have had trouble.

Q It might be that they would have to be fixed up?

A The roads would have to be fixed, but I think we have enough money in our estimate for pipeline installation and right-of-way that would take care of that. I know about what you have to do whenever the roads get wet.

Q All right. I think there is just one other item that I would like to ask you about. At the top of Page 2, River Crossings, \$438,000.00. Have you a breakdown of that?

A I have a breakdown of that that I used to arrive at that and I will give it along with this other information.

Q You will supply that?

A Yes.

Q Very well, thanks very much.

Q MR. NOLAN: While you are on that, you will enumerate the rivers?

A Yes. I have them all. Each river is listed and the number of feet that it will take to get across each river. I have a list of all of them.



D. S. Goodbody,  
Cr. Ex. by Mr. Mahaffy  
Cr. Ex. by Mr. Martland

- 809 -

Q Because you told my learned friend, Mr. McDonald, you said,  
"I cannot give you the number of river crossings"?

A I haven't got it here, but it is in the office.

Q It is quite a lengthy list?

A I have forgotten how many there are, when you take in both  
routes, but they take in a great number of bridges.

Q And also the railroads and highway crossings?

A We have a number of them. We have all of that information,  
yes.

-----

CROSS-EXAMINATION BY MR. MARTLAND:

Q Just one word as to your route A, Mr. Goodbody. I gather  
from the answers which you gave yesterday that it is now your  
opinion that the slide conditions are worse on the west side  
of the Allison Pass than on the east side, is that right?

A I think the one slide is more active on the west side than  
on the east side. I think there is a greater number or a  
greater danger of slides developing on the west side. I  
had said that there was no danger of slides, and that one  
slide down there is developing quite large, I believe, on  
the west side.

Q And you told us that was a point which you missed making  
up your field notes?

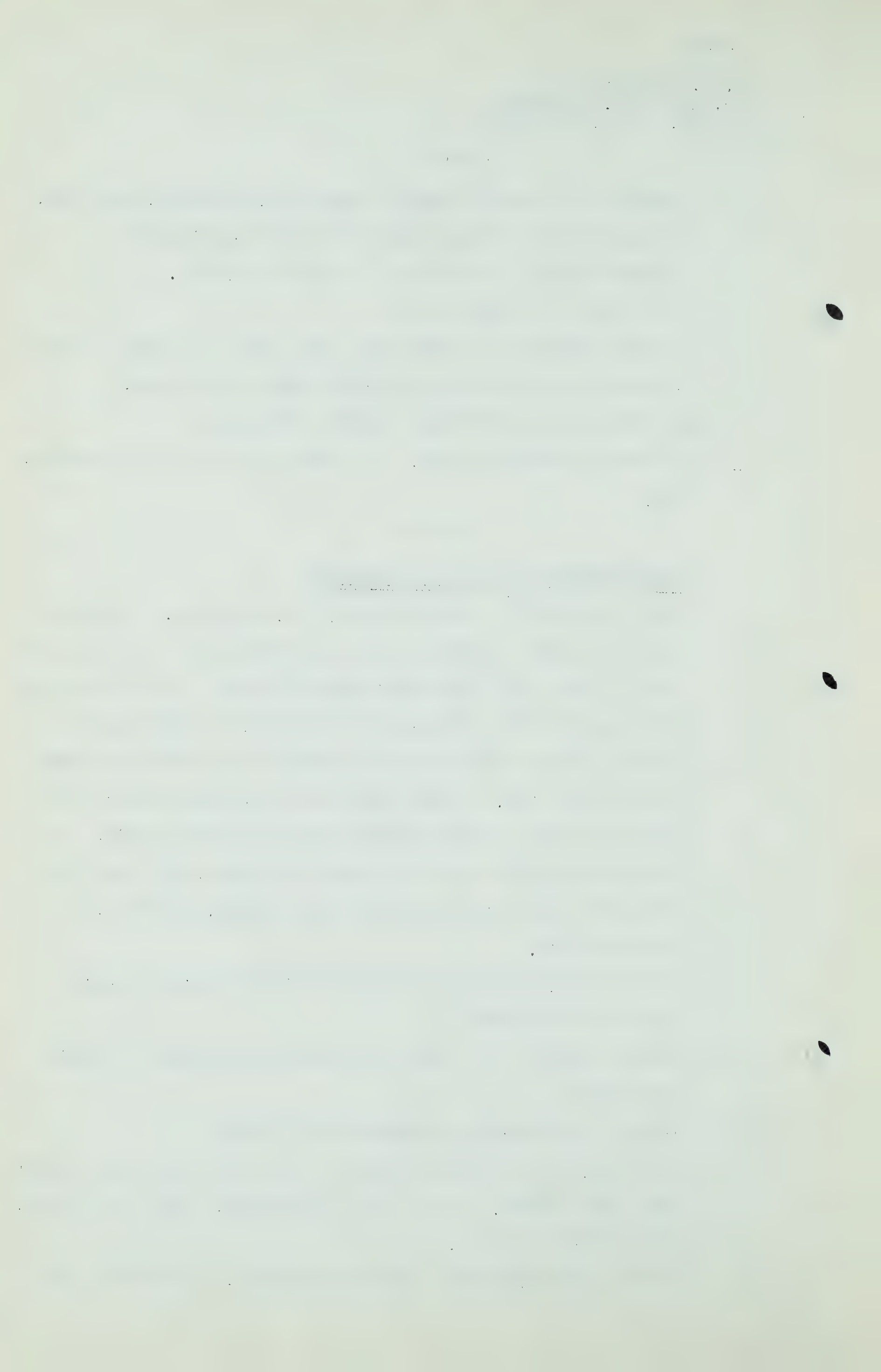
A Well, I saw it, but I did not think it was going to slide  
and it did.

Q And you discovered the mistake there when?

A Oh, last, the first possibility of the slide was last winter  
when I was there. I was there in January, I believe it was,  
that I went up there.

Q But the text which went into the exhibit, Exhibit 14, was





D. S. Goodbody,  
Cr. Ed. by Mr. Martland

- 810 -

not corrected?

A No, it was not corrected.

Q Now, I would like to ask you just a couple of questions about this grid system in Alberta, which Mr. Mahaffy mentioned. There is no provision made so far as that system is concerned for any export line to the East? It is not contemplated in that system, apparently?

A Nothing as far as I know. I do not know anything about that. That will be more Mr. Dixon's line. I would prefer that he would go into that. There is nothing on here, no connection to the East at all, we have not been thinking about it.

Q And if you wouldn't mind looking at the map there, I am not entirely clear as to one item there, with regard to the line from Jumping Pound and the line from Calgary. The lines there are quite close together. Is it contemplated that the line out of Jumping Pound, that is, the 14 inch line, will bypass Calgary?

A Yes, there is no provision made for connecting to anything at the present time.

Q So that line would run directly, it would run from Jumping Pound into the north-south main line?

A That is correct.

Q And Calgary's connection with this grid system is a line which is to the north?

A That is right.

Q Of the Jumping Pound line?

A Yes.

Q Connecting with the north-south main line, the 10 $\frac{3}{4}$  inch system?



D. S. Goodbody,  
Cr. Ex. by Mr. Martland  
Cr. Ex. by Mr. S. B. Smith

- 811 -

A Yes.

Q And I take it, Mr. Goodbody, that the direction of flow of gas on the main line, the north-south main line, would be from north to south?

A You should ask Mr. Dixon that.

Q Well, cannot you tell me?

A I would be guessing right along with you. I do not know anything about it, what comes into the design of it, and I would rather not talk about it.

Q All right.

.....

CROSS-EXAMINATION BY MR. S. B. SMITH:

Q Mr. Goodbody, first may I take you to the section in Route A from Hope to Bridal Falls, 28.4 miles, and you say, "From Hope the line follows the highway to Bridal Falls. Some places along this section are extremely rough and rocky. The only available shelf between the mountains and the river is narrow. The highway and the railway now occupy this space. In low places the pipe will require anchoring against heavy floods." You say the only available shelf is between the mountains and the river, and is narrow, and that the only available shelf is now occupied by the highway and the railroad?

A That is correct.

Q Can you put your pipeline on that only available shelf?

A I think that is placed in there that anyone who builds a pipeline through the area is going to have to work with the Highway Department of British Columbia and find a way to get through there.





D. S. Goodbody,  
Cr. Ex. by Mr. S. B. Smith

- 812 -

- Q Well, is there any assurance that you can work with the Highway Department? And you have to work with the railway too, wouldn't you, Mr. Goodbody?
- A Well, you might. The railway might enter into anything that came up there.
- Q Have you in mind that you might complete the pipeline on the highway property? Or on the railroad property, or on both?
- A I do not know exactly. You would not build it on the railroad property.
- Q Why?
- A Because there is no room along there.
- Q Because it is too narrow?
- A Yes, because it is too narrow, just room for the railroad.
- Q So that you eliminate the railroad?
- A Yes. And then the highway is built, there is a retaining wall between the highway and the railroad, and it goes back to the rock. It is something that the highway has gone through there without disturbing the present rock slopes.
- Q Yes. Now, you cannot build a pipeline underneath the surfaced highway, can you? At least, I presume you cannot?
- A It can be done.
- Q It is not likely it would be done, would it?
- A The only time I have talked to the people in Victoria about using the highway, going on the highway, they said that "You had better not contemplate using the highway". That is as far as I have gone. We haven't gone far enough to know anything more than that.
- Q If you cannot use that highway, how would you get your pipeline through there?



D. S. Goodbody,  
Cr. Ex. by Mr. S. B. Smith

- 813 -

A There are two possibilities, either in moving a lot of rock...

Q Is that above the highway?

A Yes, that is above the highway.

Q Yes?

A Or you could tunnel. Those are the two alternatives.

Q How many miles would you have to tunnel, if you were required to tunnel?

A Oh, I do not know. I think, I do not know exactly the length of those two stretches. There are two different stretches there, I do not know exactly the length of them.

Q I see. If you had to move rock, that would be to move it along the slope above the highway, would it?

A You would have to go in and have permission to use the highway, and permission to restrict the traffic, while you are working there.

Q While you were making another ledge, I suppose?

A Yes. I would think the best way would be to make a shelf close to the level of the highway, not get too far above it.

Q Could traffic move along that highway while you were carrying on that work?

A It would be, as I say, restricted. You would have to arrange to keep the highway open.

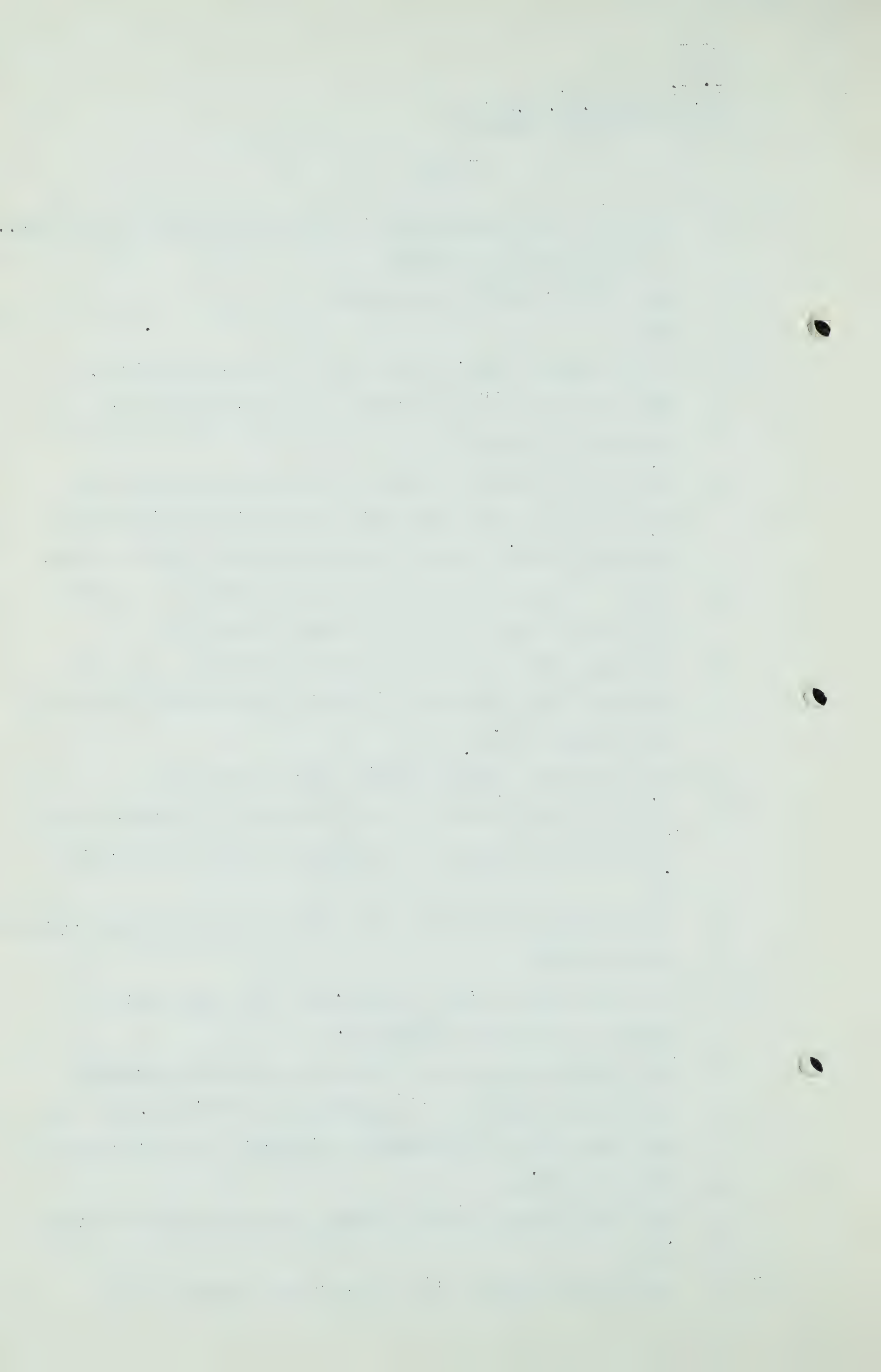
Q Mr. McDonald asked you a number of questions yesterday about your experience in maintenance of pipelines. You are essentially a construction engineer, as I understand it?

A That is correct.

Q And that was the effect, I think, of your answers to him?

A Yes.

Q But as maintenance of a pipeline, with regard to the





D.S. Goodbody,  
Cr. Ex. by Mr. S. B. Smith

- 814 -

maintenance of a pipeline, it is essentially very different from construction of a pipeline, but they are both construction problems, aren't they?

A A great many times I can imagine getting into difficulties where a break in the line would be a construction problem, and a great many of the companies call out the contractors if they do have a bad break.

Q Essentially the repairing of a break is an engineering problem?

A Yes.

Q Similar to those that you encounter in construction?

A That is correct.

Q Now, in considering these two routes, you, from the point of view of a construction engineer, did you consider the feasibility of one route as against the other in relation to the trouble that you would run into, and the maintenance costs in the future? I suppose you did?

A That is what we tried to bring out. I have not made a breakdown of the maintenance costs.

Q You do not hold yourself out as a pipeline maintenance expert? You are not a pipeline maintenance expert?

A I set up the crews, I set up the people, I do not attempt to do that.

Q But you do consider yourself qualified to say that it is safer to build this pipeline in this type of territory than some other type of territory?

A Oh, yes, definitely.

Q Taking into account the requirements for maintenance in the future and the risks?

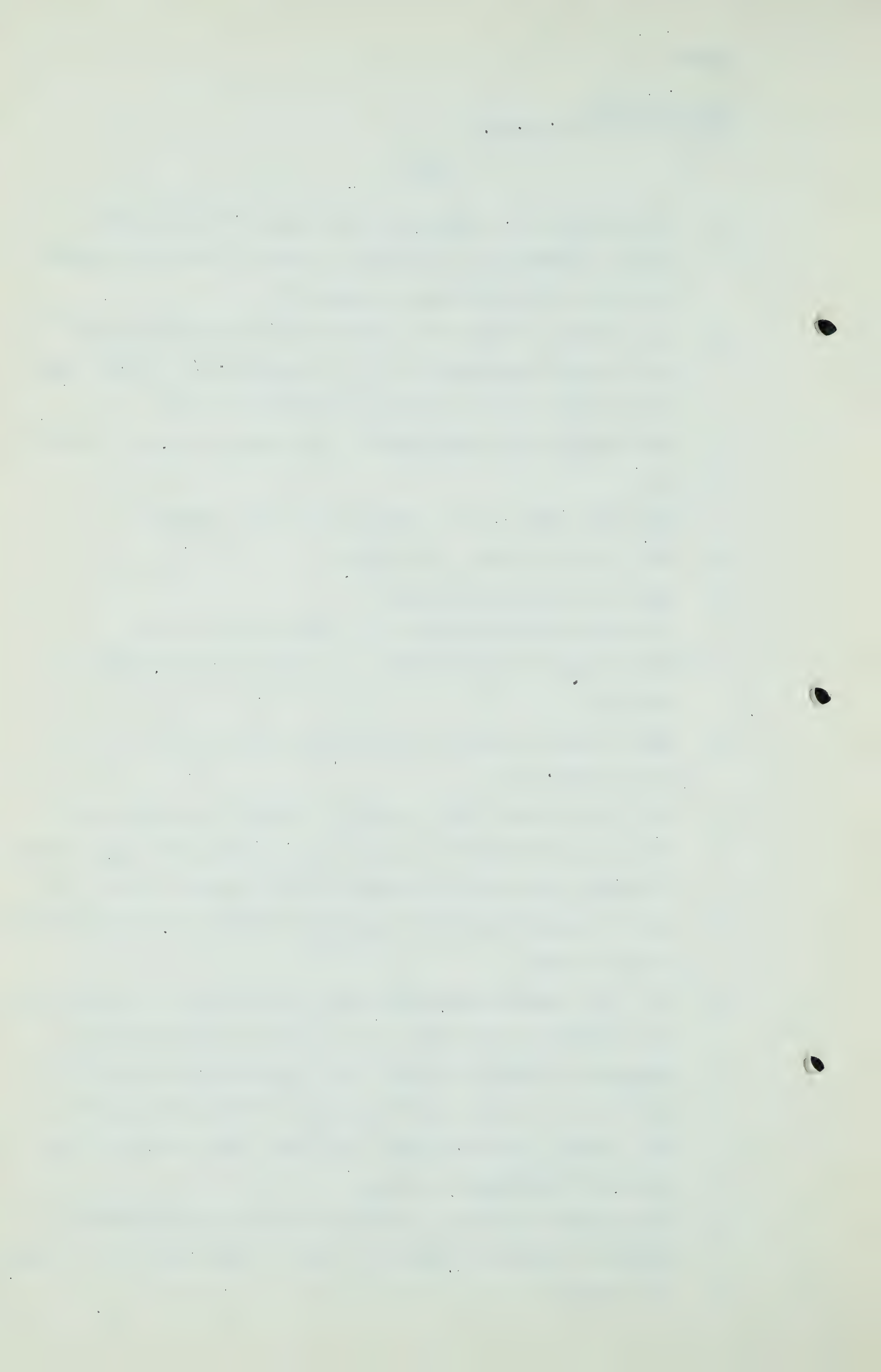
A Yes, I do, the risk part of it.



D.S.Goodbody,  
Cr. Ex.by Mr. S. B.Smith

- 815 -

- Q Tell me this, as between the two routes that you have given consideration to in those briefs, there is no doubt which one you prefer and recommend?
- A No, I would not like to leave any doubt. We eliminated Route A when we flew over it as being so much rougher than Route B that we did not get an estimate on it.
- Q Tremendously more expensive to construct, in your opinion?
- A Yes.
- Q And more difficult to maintain in your opinion?
- A Yes, more difficult of access.
- Q Route A as against Route B?
- A It would naturally add to your maintenance costs.
- Q Greater risk of interruption on A than B, interruption to service?
- A That is what I tried to bring out. In the slide areas I think there is.
- Q Well, time after time, on your A route, the western part of it, you will have to resort to anchoring the pipe because of slides, the risk of snowslides and moving areas. Do all those things contribute to possible breaks and interruptions in the service?
- A Yes, they would contribute. Well, the weight of the pipe and the covering of the pipe, if you had your pipe properly weighted, it should not add any maintenance if you had a flood area, or not, and if you had a flood area and you had a break and you couldn't go down, there would be the trouble of getting in there.
- Q Do you think there is a serious chance of interruption of service, that is, on Route A, that is the route west of Yahk, of course?





D. S. Goodbody,  
Cr. Ex:by Mr. S. B. Smith

- 816 -

A Yes, I think the Nelson Range would afford quite a hazard, and that the Allison Pass area, those slide areas, I think, will both contribute to the possibility of interruption.

Q Is the possibility of interruption of service on the other route much less than it is on the A route?

A I think it is a great deal less.

Q You could not measure it in percentages, I suppose?

A No.

Q Well, now, besides the slides, in the Allison Pass, the snow itself is a great problem there, isn't it?

A Well, the snow is a problem if it builds up to where you cannot get over it. With regard to the east side of the mountains, of the Pass, the difficulty will be getting from the highway to the line. The snow should not build up too high on that side. The west side will build up considerably higher.

Q Well, then, snow comes comparatively early, does it not, on that part of the highway? Were you there last September?

A No, I was not there last September.

Q When was the road opened?

A Beg pardon?

Q When was the Princeton road opened?

A Officially opened about the 1st of November.

Q I thought it was earlier than that, as I seem to recall that just about the time of the official opening that they had difficulties with snow at that time?

A No. I think the first snowfall was the latter part of October. I think it was open in November. I am not sure. I was through there earlier than that.





D. S. Goodbody,  
Cr. Ex.by Mr. S. B.Smith

- 817 -

Q Do you recall at or about the time of the opening many motorists were marooned on that road because of the snow?

A I do not know that.

Q You do not know that?

A No.

Q Has it been possible to keep it open of snow, that road?

A As far as I know, as far as the snow is concerned, they have kept the snow off, I believe.

Q Well, now, Mr. Goodbody, I would like to talk to you for a while about roads, and I would like you to understand that I come from Edmonton, and that I have been associated with the Association that has been advocating the construction of a Trans-Canada Highway through the Yellowhead Pass. In fact, I presented two briefs in regard to that in Ottawa, one to the Cabinet, and one to the Royal Commission on Transportation. We are very anxious in that part of the country to have the Trans-Canada Highway go through Edmonton. That was my view at that time, and it is still my view. I want to find out from you the relationship, if I can, and perhaps I should tell you that the Dominion Government in its wisdom has decided to put the Trans-Canada Highway through the Kicking Horse Pass and not the Yellowhead Pass.

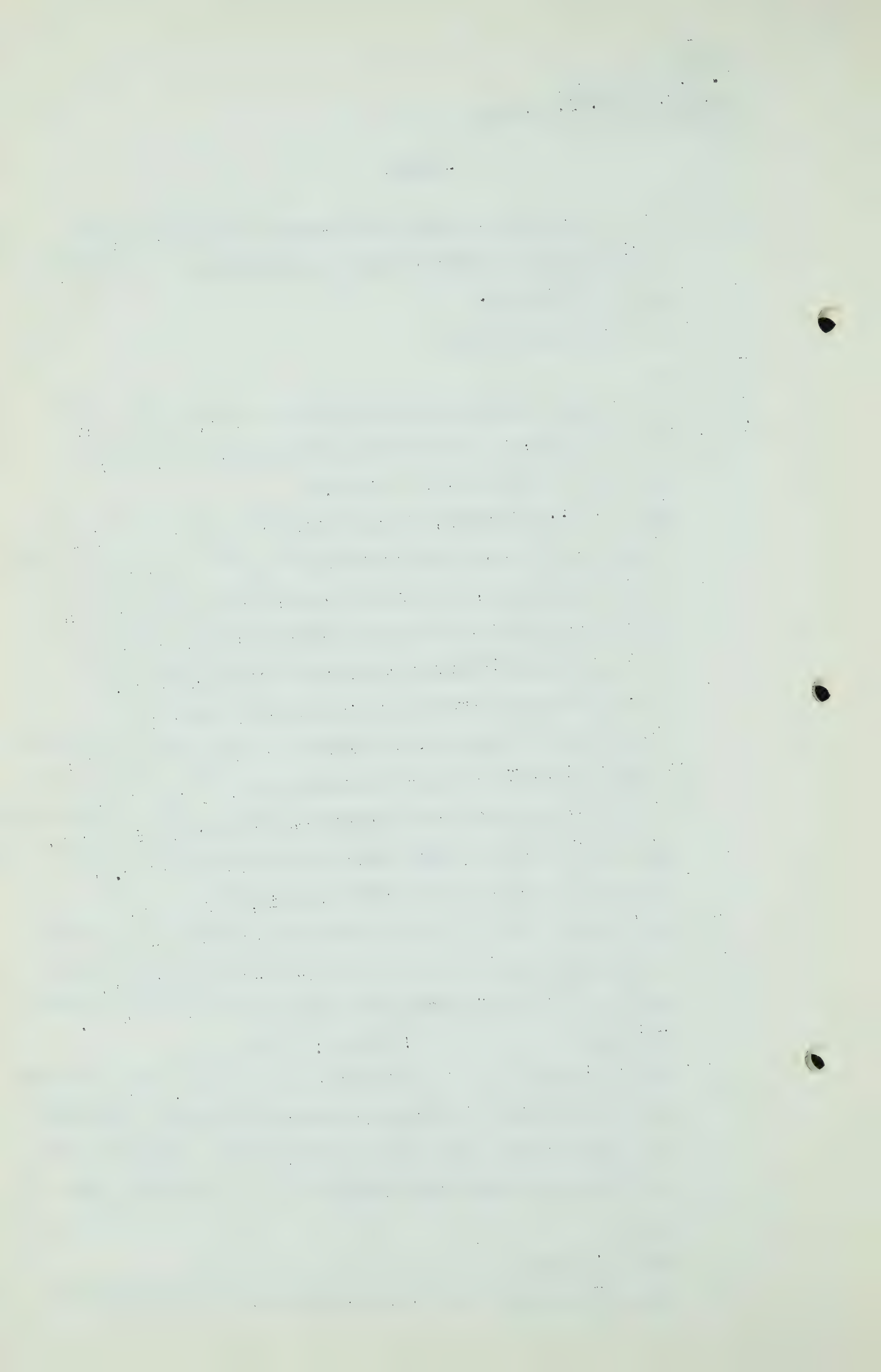
MR.NOLAN:

Hear! Hear!

Q MR.S.B. SMITH: We talk a lot about roads, because you cannot build a pipeline without getting the equipment in, getting your pipe in, and your men and everything of that kind, and you cannot maintain it if you cannot get in there?

A That is right.

Q Now, there have been a considerable amount of statements



D. S. Goodbody,  
Cr. Ex. by Mr. S. B. Smith

- 818 -

made lately to the effect that if a pipeline is built through a certain route, that a permanent highway is bound to follow there, and I want to examine that question in some detail with you. If you are building a pipeline through a portion of the mountains in which there is no highway, what kind of a highway would the pipeline company build, Mr. Goodbody?

A Well, in my experience we would not compare it to a highway, just if we could get over it, and if we could get over it, why, we would call it good, and that would be - we would go up to 15 to 20% grades, as long as four-wheel drive equipment could go over it.

Q What grades?

A 15 to 20%, as long as our equipment could go over it.

Q 15 to 20%, did you say?

A Yes. The four-wheel drive equipment can go up to 35%.

Q Can you carry ordinary highway traffic over a road with a 15 to 20% grade?

A Well, one would have to be very optimistic to think about it. Certainly, I do not know of any roads in Canada that are being travelled at the present time as main highways that have grades that steep.

Q Well, tell us more about these roads that you use for construction and maintenance? Would they be roads over which motor vehicles could travel throughout the year, and would be open to all motorists? I am talking about, say, a piece of virgin territory, where you were going to build a pipeline where there are no roads at all?

A I believe a pretty close comparison to that would be the power lines. You are all familiar with the power lines.





D. S. Goodbody,  
Cr. Ex. by Mr. S. B. Smith

- 819 -

They all have a road, generally, and they have some kind of accessibility to get to the power lines, and it goes along by the power line, and I do not think that the general run of traffic would go on it. If you own the right-of-way you would not allow the general public to travel over that road.

Q Tell me, what would you do when you are building a pipeline, say, across prairie country, and a piece of prairie country where there are no roads close to the route of your pipeline, what would you do there about roads? Would you build a roadway parallelling the pipeline, or would you have a type of road that would be useful, or what would it be useful for?

A Well, if it is like a lot of the country west of Macleod, it is more or less unbroken country, and we wouldn't touch it, and more than likely we would go in and use it just as it is. We would fill up the holes, if there were any, in the road, and the only road that there would be would be that made by the tires of the trucks as they hauled the pipe in.

Q All right. Let us get into the mountains. Do you want to add anything to your description of the type of road you would build in the mountains where you were building the pipeline in virgin territory, where there was no road at all?

A Well, you would more than likely build a road 10 or 12 feet wide.

Q With grades from 15 to 20% possibly?

A And you would have to cut your curves wide enough, depending on the radius, you would have to get it wide enough, you would have to compensate on your curves, you can't go or

100

[illegible]

100

D. S. Goodbody,  
Cr. Ex. by Mr. S. B. Smith

- 820 -

put a 20% grade around a curve or you wouldn't be able to get around the curve. Those things have to be compensated for.

Q Yes?

A But otherwise it would be just a steep narrow road, suited to a logging road.

Q You would hardly describe an ordinary logging road as highly suitable for truck and motor car traffic, would you?

A No, it is not very good.

Q Nothing like it at all?

A No.

Q Well, you have not been through the Yellowhead route at all?

A No, I have not been through the Yellowhead.

Q Even by rail?

A No, I have not been any further north than Merritt.

Q Mr. Goodbody, perhaps you will assume this with me, that last summer there was a cavalcade of 80 cars, there were several cavalcades through the route last year, one cavalcade of 80 cars left Edmonton and travelled to Jasper, down to Blue River, through Kamloops, and right through to Vancouver, and my recollection is that it took three days, and they were ordinary passenger motor cars, and it would have to be a fairly good road to enable them to travel that distance in three days?

A Yes.

Q Now, if that road, I have not been over it, so that I cannot describe it in detail, although I have seen moving pictures of it, it is apparently not a difficult road to travel over at the present time. Does that sound like a type of road that could be used for construction and maintenance pur-





D. S. Goodbody,  
Cr. Ex. by Mr. S. B. Smith

- 821 -

purposes? I suggest it does.

A Well, I cannot - just from what I have heard, if you can get over it with a car, why, we could get in with maintenance equipment.

Q Well, is there any shadow of truth in the suggestion that because a pipeline is going to be built through a certain part of the Province there is going to be a motor road, a paved highway, through that part of the country? That does not follow at all, does it, Mr. Goodbody?

A I do not know of any pipeline that I know of that has caused a road to be built in the area.

Q Roads are built as highways, ordinarily, aren't they? And pipeline are pipelines, and they are just completely severable, aren't they?

A Yes, they are different.

Q They are different?

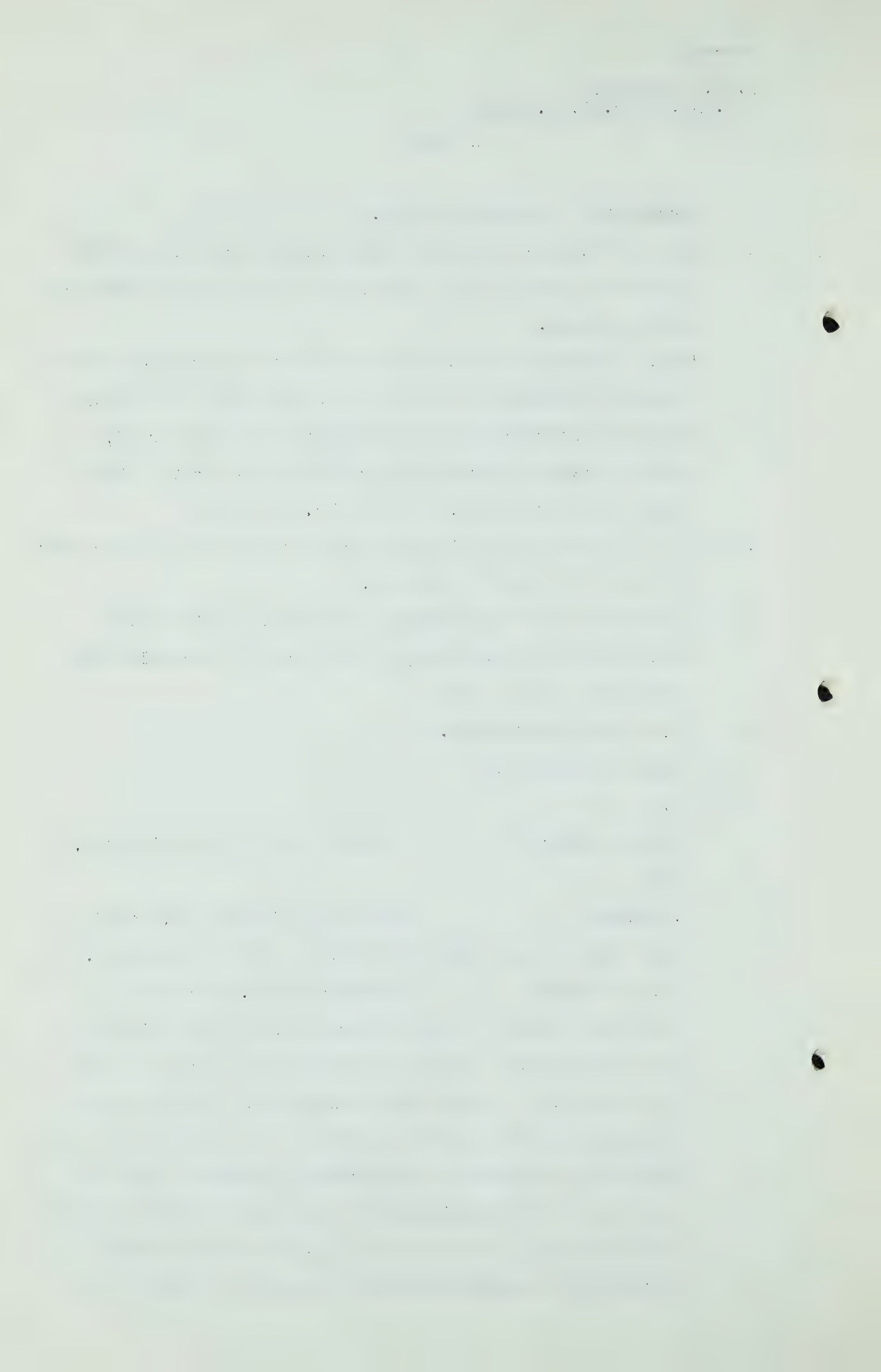
A Yes.

MR. S. B. SMITH: I think I will be some time yet, sir.

MR. NOLAN: Before you adjourn, sir, may I just speak to my associates here. I have a suggestion.

MR. S. B. SMITH: Perhaps while Mr. Nolan is addressing himself to that matter, sir, I could bring up one other matter. As to the application of Prairie Pipelines Limited, I would like to make this statement that the applicant has caused a petition to be presented to the Parliament of Canada to incorporate a company under the provisions of The Pipeline Act with the name Prairie Pipelines Limited. If its charter is granted then Prairie Transmission Lines Limited will apply to the Board for





D. S. Goodbody,  
Cr.Ex.by Mr.S. B.Smith

- 822 -

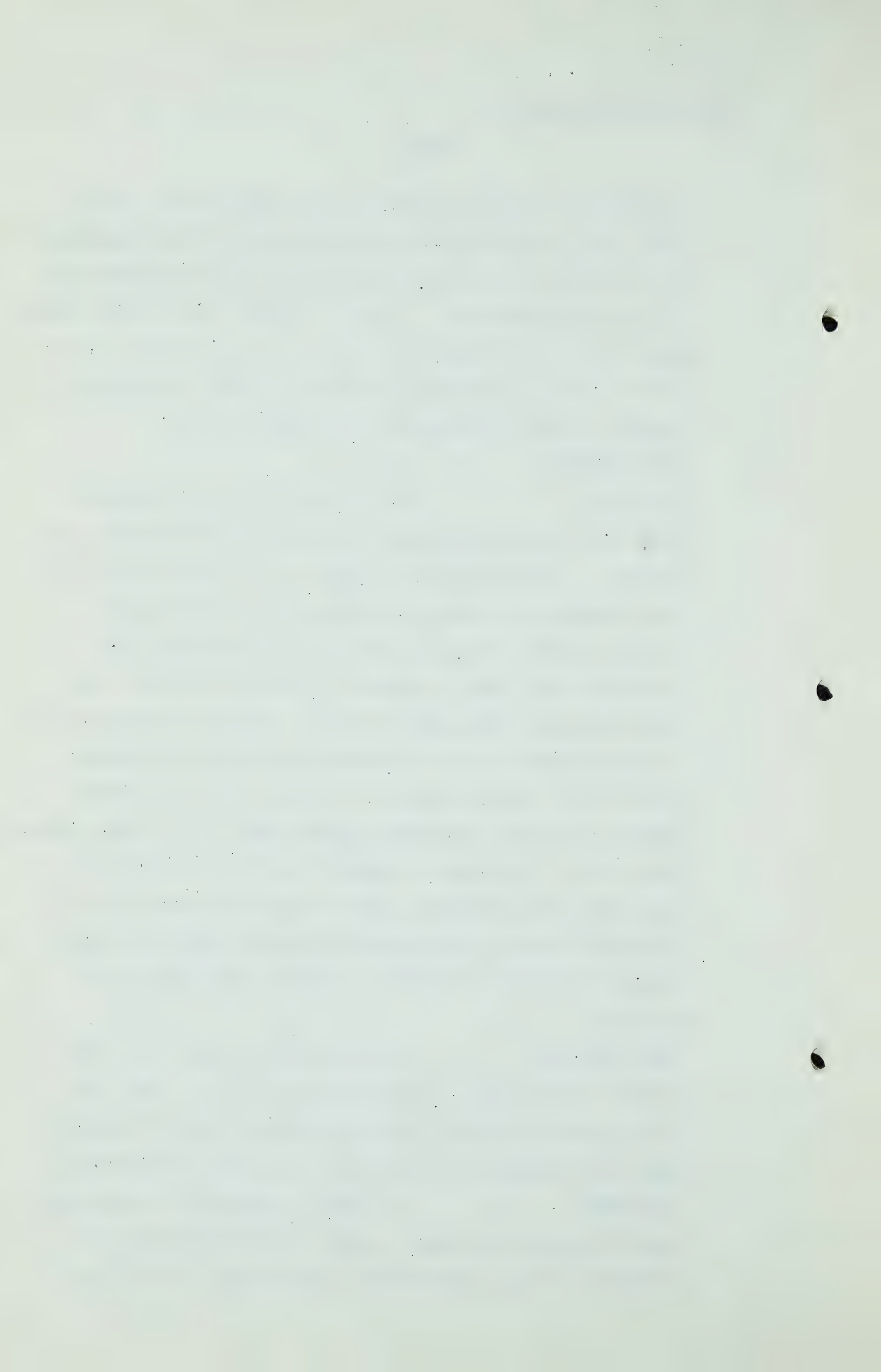
permission to join in support of the application. Now, sirs, may I now inform the Board what has already appeared in the Press, that Prairie Transmission Lines Limited has now been incorporated. It has a charter. The Act has been passed by the Parliament of Canada, and I, therefore, now ask for leave to Prairie Transmission Lines, for whom I appear, to join in support of its application.

THE CHAIRMAN: Yes.

MR.NOLAN: The suggestion I was going to make, sir, is concerned with the progress that we are not making. I accept my full share of the responsibility of the slowing up of the proceedings. We are planning to adjourn tomorrow at one o'clock, as I understand it. In view of that fact, a number of people with whom I am associated, have made plans to leave tomorrow afternoon, and I do not think it will be possible to extend the hearing beyond one o'clock tomorrow. In view of the fact that everyone has been preparing himself with that in view, therefore, sir, I am going to suggest to you that perhaps we could sit this afternoon, and in that way we will get to the point in the presentation of our case which the Board desires to arrive at before we adjourn tomorrow at one o'clock.

THE CHAIRMAN: I would like to hear from other counsel. Mr. Nolan, I am afraid we could not come back before three o'clock. We, unfortunately, have an appointment, but we might sit from 3 to 5, if that is agreeable.

MR.NOLAN: If that is agreeable to the Board and the counsel, we will be here and available to give evidence between those hours, and we think it will be of



D. S. Goodbody,  
Cr.Ex.by Mr. S. B.Smith

- 823 -

assistance.

MR.MAHAFFY:                   Everybody seems to be looking at me just at the moment, at least, it is my feeling that they are. Those of us that have offices in Calgary have arrangements, or, at least, I have made some arrangements for this afternoon, but if it suits everybody else, why, I will reshuffle if I possibly can.

MR.NOLAN:                    I am sorry we are in this position, but it is something that is quite beyond my control.

THE CHAIRMAN:               Well, if Mr. Mahaffy is the only one....

MR. MAHAFFY:                I am not objecting, sir.

THE CHAIRMAN:               We will adjourn until three o'clock.

MR.C. E. SMITH:             Before we adjourn, does anyone want me to rewire Edmonton and tell them to stay at home tomorrow, now that we have changed our minds, or what? You remember we had discussed the matter of the parties coming from there?

MR. NOLAN:                  I think they should come, sir. That is one of the reasons why we want to sit this afternoon to allow them to have a little time before one o'clock tomorrow.

THE CHAIRMAN:               Yes, I think so.

(Hearing adjourned and resumed at 3. P.M.)





D. S. Goodbody,  
Cr. Ex. by Mr. S.B. Smith.

- 824 -

Q Mr. Goodbody, I think you yesterday described these access and maintenance roads. Those are the terms you used to describe them?

A Yes.

Q As being low-grade roads?

A Yes.

Q Is that a good description of them? That perhaps flatters them, does it?

A It depends on the district you were from and the country you were from. I would say it is extremely low-grade road. I do not know what to compare them to up here.

Q Well, you would hardly be justified in calling them roads at all, would you, in the ordinary sense?

A Well, normally an access road or a maintenance road does not go any place, it is merely to get close to the pipeline.

Q Well now, Mr. Goodbody, one other thing I would like to ask you about. You have here, I believe, amongst those plans, which I have not had an opportunity of examining in detail, I think that is Exhibit 19, is it?

MR. NOLAN:

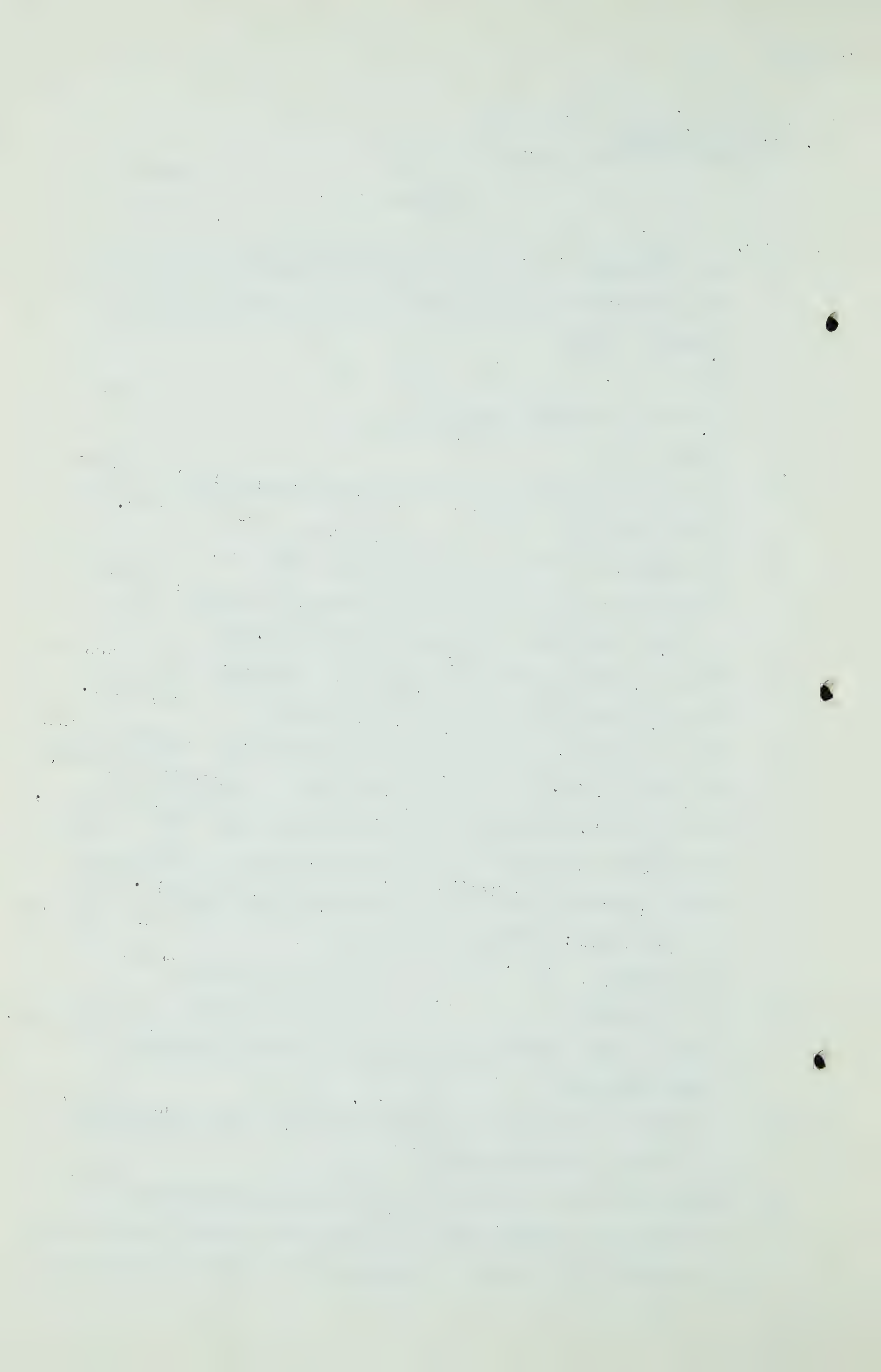
Those are the maps.

Q MR. S.B. SMITH:

Yes. Some of them are aerial views of the country, as a result of aerial photography, aerial mapping?

A I think the Canadian topographic maps are from photographs, are taken from photographs.

Q Well now, we so far have had oral evidence descriptive of the type of territory through which those various routes pass. I wondered if you had any photography you had taken yourself,



D. S. Goodbody,  
Cr. Ex. by Mr. S.B. SMITH:

- 825 -

any description of the areas of any kind that might give us a better idea?

A You mean along the routes?

Q Yes?

A I have nothing with me, nothing here. We have taken some pictures along the road but I do not have them with me.

Q You have not any?

A No.

Q You did make some?

A We did take some.

Q Would those pictures assist in obtaining a realization of what the territory is like?

A These that we have are limited in scope, they were taken along at quite wide intervals. We have taken them of spots we wanted to remember particularly.

Q I am particularly interested in the area from Yahk to Alder-grove.

A We have photographs that we have taken along that road, I would say that more than likely at intervals of every, oh, I don't suppose they are any closer than 10 or 15 miles, the ones we have.

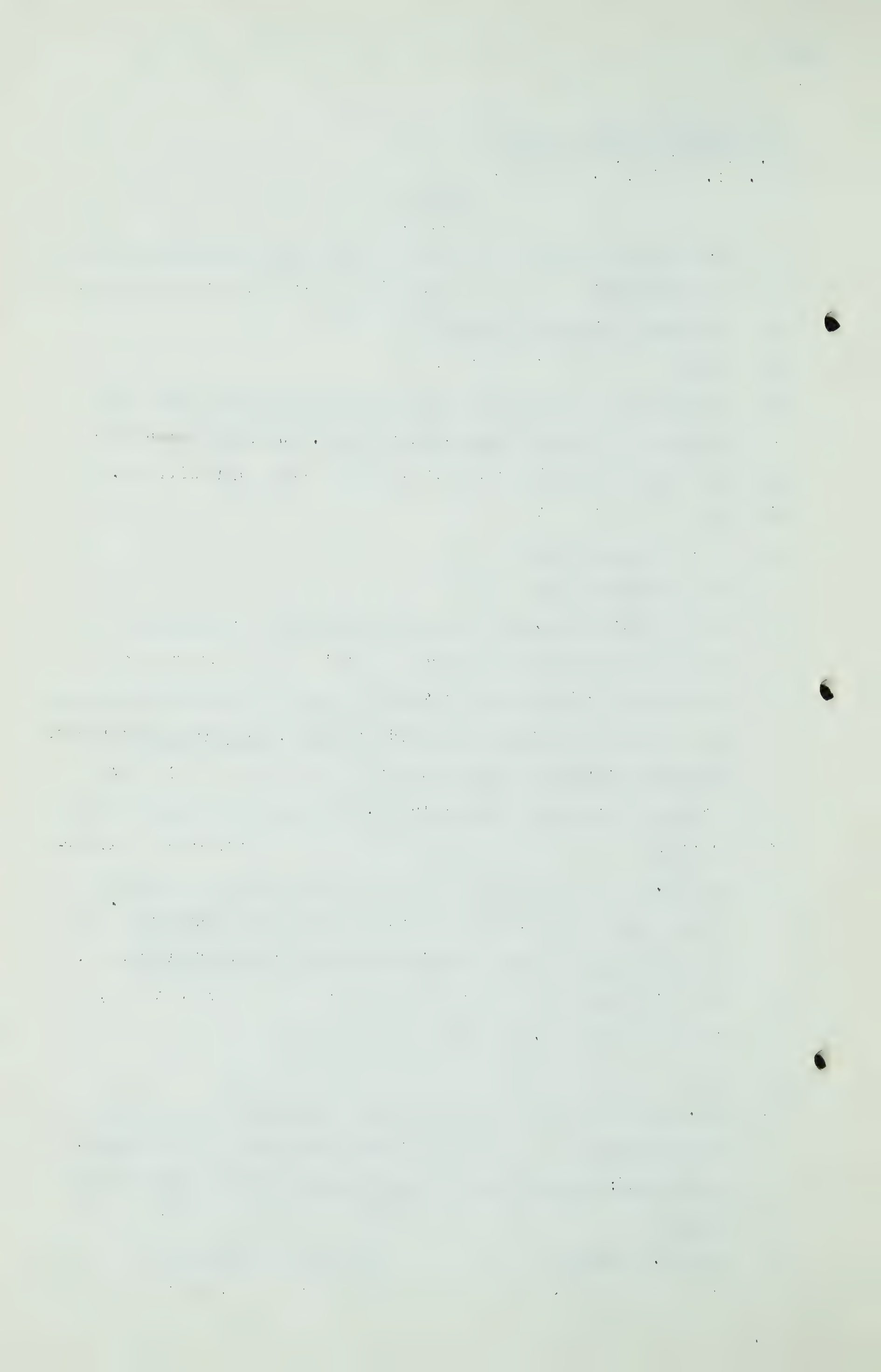
Q But you have none of them here with you?

A No.

Q Do you think they would be of any assistance to the Board?

MR. NOLAN: May I interject to say while the witness says he has not got them here, they are in the hotel.

MR. S.B. SMITH: Are they in Calgary?

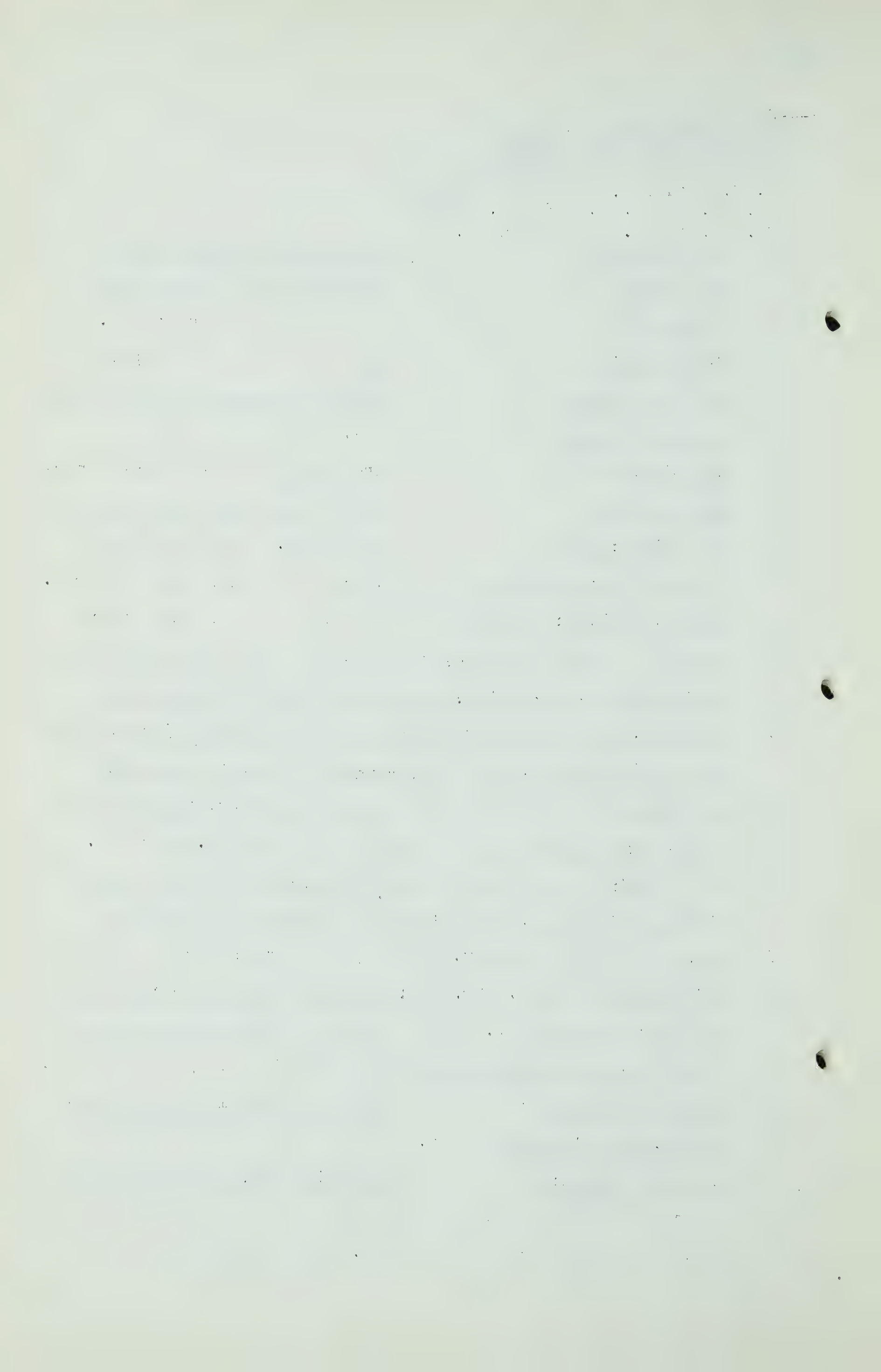


D. S. Goodbody,  
Cr. Ex. by Mr. S.B. Smith.  
Cr. Ex. by Mr. D.P. McDonald.

- 826 -

- A THE WITNESS: We have some in the hotel.
- MR. NOLAN: And they have a descriptive footnote?
- THE WITNESS: Yes.
- MR. S.B. SMITH: Are you agreeable to have those made available?
- MR. NOLAN: Oh, quite.
- THE WITNESS: We can send them over tomorrow.
- Q MR. S.B. SMITH: Perhaps you could have them sent over this afternoon, can you?
- A Maybe we can, Mr. Smith.
- Q Now sir, I had intended to go into some other subjects, also with this witness, but I understand from my friends that perhaps the next witness might be the appropriate one to ask the further questions I had intended to ask Mr. Goodbody.
- Q MR. NOLAN: If the Board will receive those photographs, some of them were taken by you?
- A No, I did not take them. I was present when a great many of them were taken. Mr. Copp took all of those pictures that are coming over.
- Q They will be sent for and will be here in a very few minutes.
- MR. D.P. McDONALD: Just one question arising out of Mr. Smith's examination.
- MR. S.B. SMITH: What is this, re-examination, re-cross-examination?
- Q MR. D.P. McDONALD: Mr. Smith discussed with you





D. S. Goodbody,  
Cr. Ex. by Mr. D.P. McDonald.

- 827 -

the matter of going around the rock bluff just west of Hope,  
between Hope and Flood?

A Yes.

Q And I think your answer was that it would be a tunnelling  
proposition or a very difficult side-hill rock?

A Yes.

Q That would be the difficulty of the railway and the road?

A That is right.

Q Wasn't there an alternative method of getting around that  
particular area that you can think of?

A Well, the only alternative might be going over the top of  
that mountain, which is a long ways to the top.

Q The other way would be to cross the river and go down the  
other side of the river?

A Yes, I, frankly, have not examined the other side of the  
river because I did not want to go over on the other side of  
the river with the line. You would have two river crossings.

Q If you read the transcript of the Westcoast Transmission, Mr.  
Phillips provided for two river crossings to go around that  
particular bluff on the Fraser.

A The only recollection I have was discussing staying on that  
side of the river.

Q MR. S.B. SMITH: Well, are conditions on the  
other side similiar or dissimilar?

A I would rather say I do not know because I have not been  
over there. It looks rocky and steep. I have not been over  
there so I would not know.



D. S. Goodbody,  
Cr. Ex. by Mr. C.E. Smith.

- 828 -

CROSS-EXAMINATION BY MR. C.E. SMITH:

Q Mr. Goodbody, you have apparently thrown A out the window. I wonder why we have A here at all? Was it told by somebody to use All-Canadian and then say it is not a good route or not?

A No, I have tried, and as I said, we were asked to make the one survey. We made it along the route we thought was best. Mr. Dixon asked us to make a survey of a route that we could get through on, an All-Canadian route. He knew about the Pass. So we have worked up this cost, at Mr. Dixon's request, and I do not know just where his request originated.

Q Okay. Now that everybody concerned is content with the figures as to costs - - I take it that is correct, is it, Mr. McDonald?

MR. McDONALD: Are you referring to the Canadian route, the Route A or Route B?

Q MR. C.E. SMITH: Tell me, what happened to Routes C, D and E, do they have any interest?

A Well, I doubt their interest. They all go into the States and the total amount of them is almost equal to Route A. They just go through isolated country in the northern part of Washington.

Q Although something was done in connection with the investigation of three other routes, apparently there is nothing coming before the Board with respect to them as far as you know?

A As far as I know I have not been instructed to present anything further.





D. S. Goodbody,  
Cr. Ex. by Mr. C.E. Smith.

- 829 -

Q You said they are through the States. Do you mean they are similarly through the States to what you call B through the States?

A No, sir. There are three routes. One of them goes across at Kingsgate down to Newport in Washington, and then goes back north and crosses the Line and comes in at Columbia Gardens and goes west through Trail and stays in Canada the rest of the way across. The next plan goes over the Nelson Range and then drops into northern Washington just south of Trail and stays in Northern Washington, crosses just south of Osoyoos and then comes back into Canada and on into New Westminster.

Q Maybe I can shorten this. In any event, in so far as you are concerned, there will be no submission by you in any event to this Board with respect to route costs of any of these things?

A No, we have not prepared anything further.

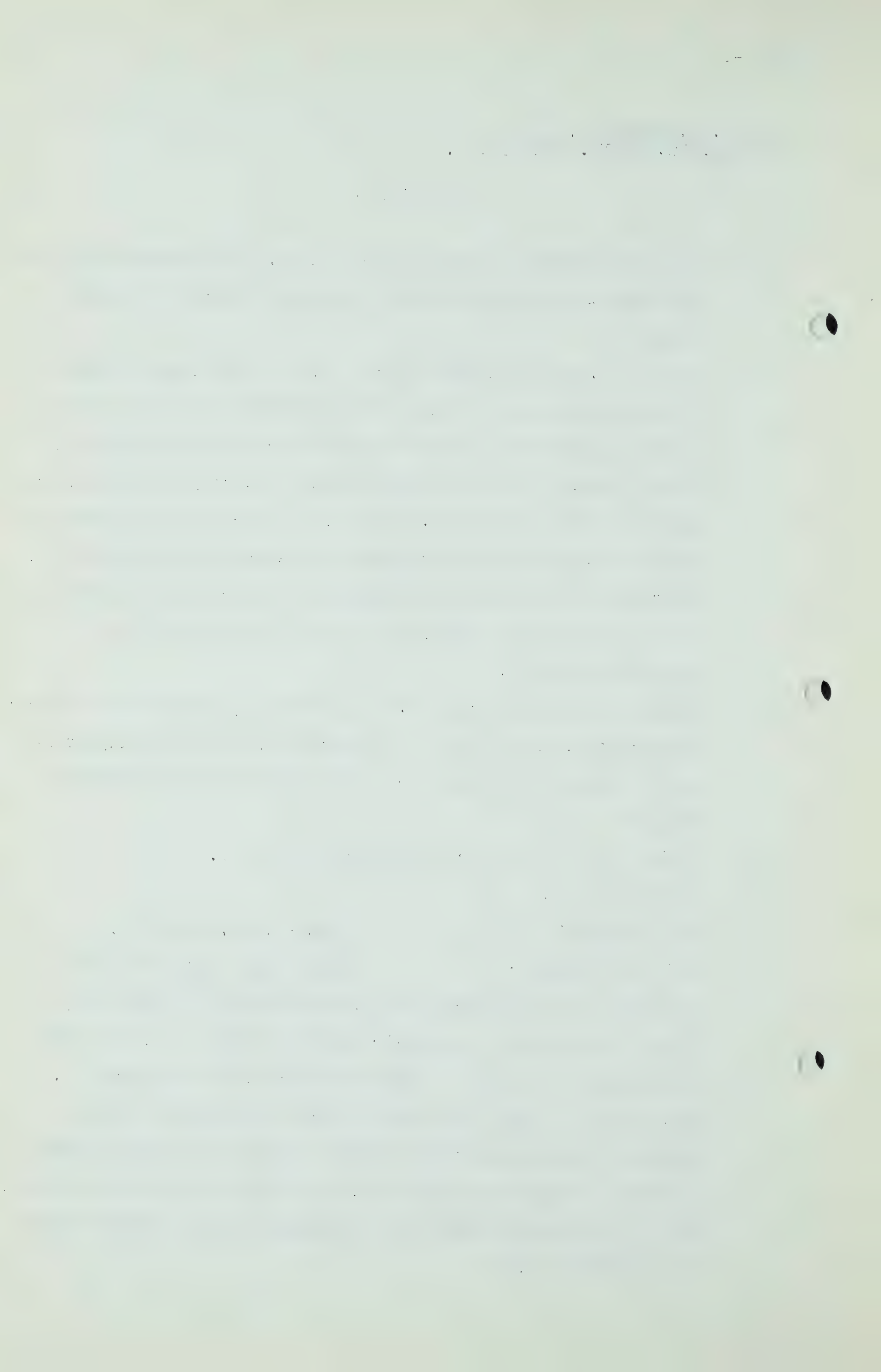
Q That is all.

THE CHAIRMAN:

Thanks, Mr. Goodbody.

MR. S.B. SMITH:

This morning I applied for permission to have Prairie Transmission Lines Limited join to the application of Prairie Pipelines Limited. Before the matter was dealt with I think something else intervened. May I take it that I have the Board's permission to have Prairie Transmission Lines Limited joined to the application of Prairie Pipelines Limited, and then my notice to the press will be amended and we will be published in the name of those two companies, sir?



Discussion.  
A. B. Allyne,  
Dir. Ex. by Mr. Nolan.

- 830 -

THE CHAIRMAN: Right.

MR. NOLAN: I am instructed to say, sir, with regard to Routes C, D and E, we would be glad, when an opportunity presents itself in the fall to submit to the Board a description of those routes with the assistance of maps and also an estimate of the costs. The work has been for the most part done and while we would not present it in the detail we are presenting it with respect to A and B, I think it would be sufficient to give the Board the information that they require.

MR. C.E. SMITH: I was not suggesting the Board required anything. I just wondered what happened to C, D and E, that is all.

MR. NOLAN: We did work it up and then we felt that we did not require it.

THE CHAIRMAN: I think we will leave that entirely up to you, Mr. Nolan.

MR. NOLAN: I will call Mr. Allyne, please.

ARTHUR B. ALLYNE, having been first duly sworn, examined by Mr. Nolan, testified as follows:

Q Mr. Allyne, you have been sworn?

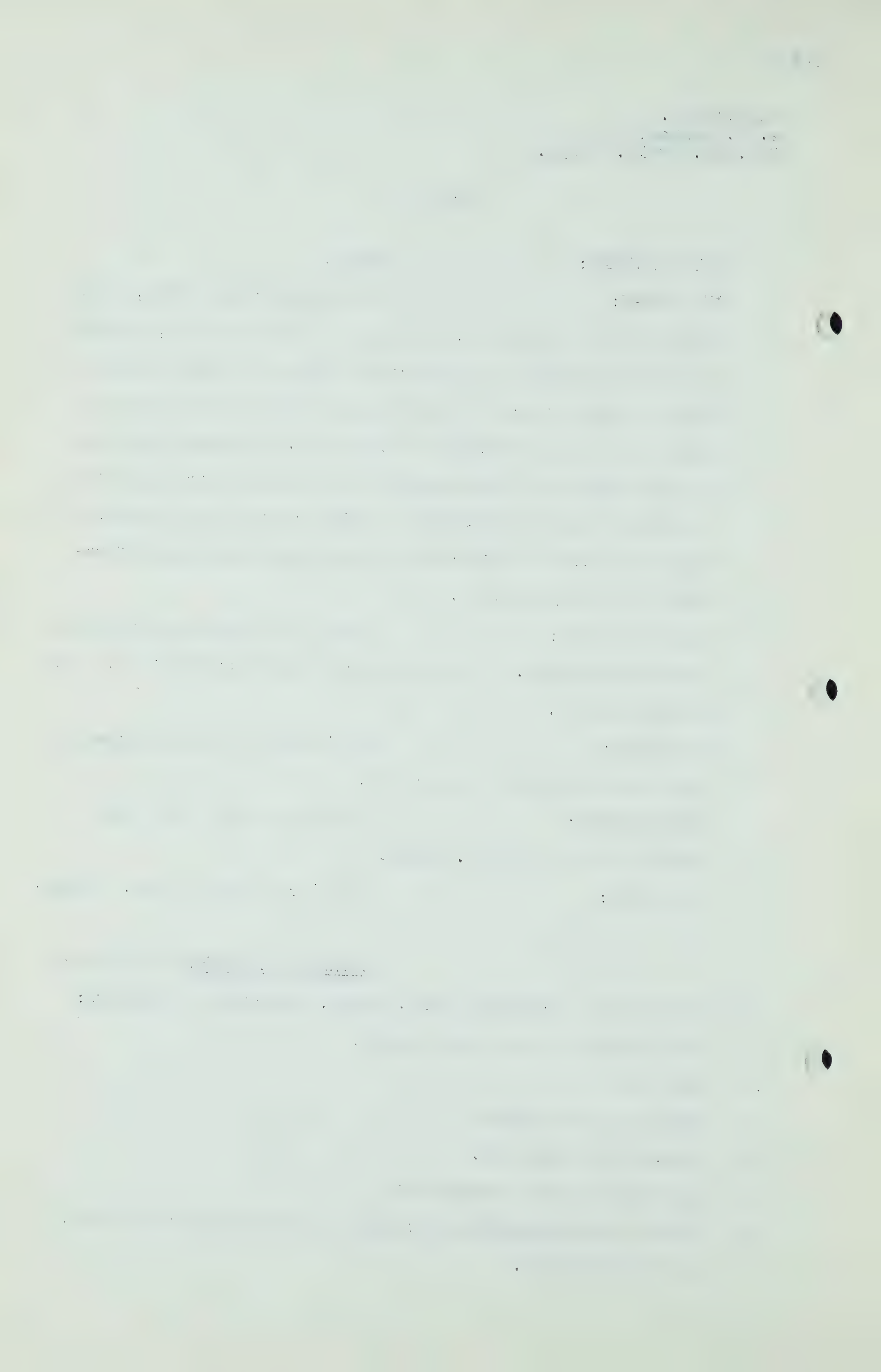
A Yes, sir.

Q Where do you reside?

A Bronxville, New York.

Q And what is your occupation?

A I am a gas engineering consultant for Ebasco Services Inc. of New York City.



A. B. Allyne,  
Dir. Ex. by Mr. Nolan.

- 831 -

Q Well, I intend to ask you something about Ebasco Services but perhaps you will give me something of your own qualifications, if you will, please.

A I attended the California Institute of Technology in Pasadena, California, and received a degree of chemical engineer in 1926. Except for a period of military service I have been engaged in various phases of the gas and oil business for the past twenty-four years.

After one year in the Shell Oil Company of California's research laboratories I became chemist for the Southern Counties Gas Company of California in Los Angeles. During the period 1927 to 1937 this work involved chemical and engineering studies on many natural gas transmission and distribution problems with particular reference to dehydration, soil corrosion of pipe and cathodic protection. Also during this ten-year period I was active in the Pacific Coast Gas Association serving as a member and chairman of several committees, including the Technical Section in 1937. I am the author of some twenty technical papers dealing with numerous problems of the natural gas industry which have been presented before trade association meetings and published in the trade journals.

In 1937 I joined the staff of the Public Utility Division of the California Railroad Commission as an associate engineer and later became senior gas engineer. In the work for the Commission I was directly responsible for the preparation of numerous earnings forecasts and rate structure studies covering both gas and





A. B. Allyne,  
Dir. Ex. by Mr. Nolan.

- 832 -

electric utilities as well as various economic surveys and the promulgation of a state-wide order for the construction, operation and maintenance of all gas holders in California.

In 1942 I left the California Commission to enter the Chemical Warfare Service of the United States Army. During the next three and a half years I served for various periods as executive officer of the Dallas Chemical Warfare Procurement District and as executive officer and later as Chief, Special Projects Branch, Inspection Division, of the Office of the Chief, Chemical Warfare Service. During this tenure I passed through the grades of Lieutenant to Lieut.-Colonel.

On release from the service in 1945 I joined the staff of Ebasco Services, Inc. of New York City as a gas engineering consultant. From that time to date I have been responsible for numerous engineering and economic studies on many types of gas properties and systems throughout the United States, Canada and Central America. This work has embraced transmission and distribution systems, pipe lines, gas plants, peak load studies and butadiene plants as well as various problems of management. During the past year and a half I have served as project manager for the new natural gas transmission system being built in East Tennessee for the East Tennessee Natural Gas Company. In this work I have been directly responsible for the design, engineering, estimating of costs and supervision of construction of the company's 22" pipe line from the vicinity of Nashville across the mountains to the United States' atomic energy plants at Oak Ridge, Tennessee, and some 400

1. 1. 1.

[illegible]

1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100. 101. 102. 103. 104. 105. 106. 107. 108. 109. 110. 111. 112. 113. 114. 115. 116. 117. 118. 119. 120. 121. 122. 123. 124. 125. 126. 127. 128. 129. 130. 131. 132. 133. 134. 135. 136. 137. 138. 139. 140. 141. 142. 143. 144. 145. 146. 147. 148. 149. 150. 151. 152. 153. 154. 155. 156. 157. 158. 159. 160. 161. 162. 163. 164. 165. 166. 167. 168. 169. 170. 171. 172. 173. 174. 175. 176. 177. 178. 179. 180. 181. 182. 183. 184. 185. 186. 187. 188. 189. 190. 191. 192. 193. 194. 195. 196. 197. 198. 199. 200. 201. 202. 203. 204. 205. 206. 207. 208. 209. 210. 211. 212. 213. 214. 215. 216. 217. 218. 219. 220. 221. 222. 223. 224. 225. 226. 227. 228. 229. 230. 231. 232. 233. 234. 235. 236. 237. 238. 239. 240. 241. 242. 243. 244. 245. 246. 247. 248. 249. 250. 251. 252. 253. 254. 255. 256. 257. 258. 259. 260. 261. 262. 263. 264. 265. 266. 267. 268. 269. 270. 271. 272. 273. 274. 275. 276. 277. 278. 279. 280. 281. 282. 283. 284. 285. 286. 287. 288. 289. 290. 291. 292. 293. 294. 295. 296. 297. 298. 299. 300. 301. 302. 303. 304. 305. 306. 307. 308. 309. 310. 311. 312. 313. 314. 315. 316. 317. 318. 319. 320. 321. 322. 323. 324. 325. 326. 327. 328. 329. 330. 331. 332. 333. 334. 335. 336. 337. 338. 339. 340. 341. 342. 343. 344. 345. 346. 347. 348. 349. 350. 351. 352. 353. 354. 355. 356. 357. 358. 359. 360. 361. 362. 363. 364. 365. 366. 367. 368. 369. 370. 371. 372. 373. 374. 375. 376. 377. 378. 379. 380. 381. 382. 383. 384. 385. 386. 387. 388. 389. 390. 391. 392. 393. 394. 395. 396. 397. 398. 399. 400. 401. 402. 403. 404. 405. 406. 407. 408. 409. 410. 411. 412. 413. 414. 415. 416. 417. 418. 419. 420. 421. 422. 423. 424. 425. 426. 427. 428. 429. 430. 431. 432. 433. 434. 435. 436. 437. 438. 439. 440. 441. 442. 443. 444. 445. 446. 447. 448. 449. 450. 451. 452. 453. 454. 455. 456. 457. 458. 459. 460. 461. 462. 463. 464. 465. 466. 467. 468. 469. 470. 471. 472. 473. 474. 475. 476. 477. 478. 479. 480. 481. 482. 483. 484. 485. 486. 487. 488. 489. 490. 491. 492. 493. 494. 495. 496. 497. 498. 499. 500. 501. 502. 503. 504. 505. 506. 507. 508. 509. 510. 511. 512. 513. 514. 515. 516. 517. 518. 519. 520. 521. 522. 523. 524. 525. 526. 527. 528. 529. 530. 531. 532. 533. 534. 535. 536. 537. 538. 539. 540. 541. 542. 543. 544. 545. 546. 547. 548. 549. 550. 551. 552. 553. 554. 555. 556. 557. 558. 559. 560. 561. 562. 563. 564. 565. 566. 567. 568. 569. 570. 571. 572. 573. 574. 575. 576. 577. 578. 579. 580. 581. 582. 583. 584. 585. 586. 587. 588. 589. 590. 591. 592. 593. 594. 595. 596. 597. 598. 599. 600. 601. 602. 603. 604. 605. 606. 607. 608. 609. 610. 611. 612. 613. 614. 615. 616. 617. 618. 619. 620. 621. 622. 623. 624. 625. 626. 627. 628. 629. 630. 631. 632. 633. 634. 635. 636. 637. 638. 639. 640. 641. 642. 643. 644. 645. 646. 647. 648. 649. 650. 651. 652. 653. 654. 655. 656. 657. 658. 659. 660. 661. 662. 663. 664. 665. 666. 667. 668. 669. 670. 671. 672. 673. 674. 675. 676. 677. 678. 679. 680. 681. 682. 683. 684. 685. 686. 687. 688. 689. 690. 691. 692. 693. 694. 695. 696. 697. 698. 699. 700. 701. 702. 703. 704. 705. 706. 707. 708. 709. 710. 711. 712. 713. 714. 715. 716. 717. 718. 719. 720. 721. 722. 723. 724. 725. 726. 727. 728. 729. 730. 731. 732. 733. 734. 735. 736. 737. 738. 739. 740. 741. 742. 743. 744. 745. 746. 747. 748. 749. 750. 751. 752. 753. 754. 755. 756. 757. 758. 759. 760. 761. 762. 763. 764. 765. 766. 767. 768. 769. 770. 771. 772. 773. 774. 775. 776. 777. 778. 779. 780. 781. 782. 783. 784. 785. 786. 787. 788. 789. 790. 791. 792. 793. 794. 795. 796. 797. 798. 799. 800. 801. 802. 803. 804. 805. 806. 807. 808. 809. 810. 811. 812. 813. 814. 815. 816. 817. 818. 819. 820. 821. 822. 823. 824. 825. 826. 827. 828. 829. 830. 831. 832. 833. 834. 835. 836. 837. 838. 839. 840. 84

$$f(x) = \frac{1}{2} x^2 - \frac{1}{2} x + \frac{1}{2} \ln x$$

10

•

•

• •

1.

A. B. Allyne,  
Dir. Ex. by Mr. Nolan.

- 833 -

miles of additional natural gas pipe lines and laterals to serve some forty towns including Knoxville and Chattanooga, Tennessee. In this position I have been responsible for the development of the company's organizational plans, operating headquarters and other facilities.

I have testified on numerous occasions before the California Commission and the Federal Power Commission on natural gas matters. I am a member of the Pipe Line Sub-Committee of the American Gas Association and a member of the Pacific Coast Gas Association.

Q Now, when you were conducting the work which you did for Northwest Gas, the present applicant, you were assisted by two gentlemen whose names are Bedell and Reed?

A That is correct.

Q Perhaps in order to inform the Board you might very briefly state who those two people were and what their qualifications are, because they are not appearing before the Board and it might be useful to know who they were and something about them.

A Briefly, Mr. L.E. Reed has had some 30 years experience as a pipeline foreman and superintendent on the estimating and construction of a number of oil and gas pipelines throughout the world. He started pipelining in 1922 and worked for various companies such as Humbolt Pipeline Company of Houston, the Oklahoma Construction Company, served variously as foreman and superintendent on cross-country pipelines. During the period from 1934 to 1946 Mr. Reed was in charge of pipeline construction work in Haifa, Palestine, the Mediterranean Pipelines, a double line from the Iraq Oil Fields to a





A. B. Allyne,  
Dir. Ex. by Mr. Nolan.

- 834 -

point near the Euphrates River, also on the Barko Concession job in the Andes Mountains in Colombia.

Q Is that the one we were told about the other day?

A I believe it is. In that particular job, which is about 200 miles long, 100 miles of it was in crossing the Andes Mountains where they were beset with continual torrential rains and rockslides. He later did a similar work in the Canal Zone with the Aldous Company on Navy and Army Pipeline work.

Mr. A.E. Bedell at the present time is Assistant Chief Estimating Engineer for Ebasco Services Inc. of New York, and is in direct charge of a staff of 22 estimating engineers plus additional supporting personnel. He, during the past year of 1949, prepared estimates on construction work totalling \$1,250,000,000.00. In past years he has served in various engineering capacities with the Max B. Miller & Company of New York, and the Texas Company of New York and the Foster Wheeler Corporation.

Q And he is a permanent employee of Ebasco Services?

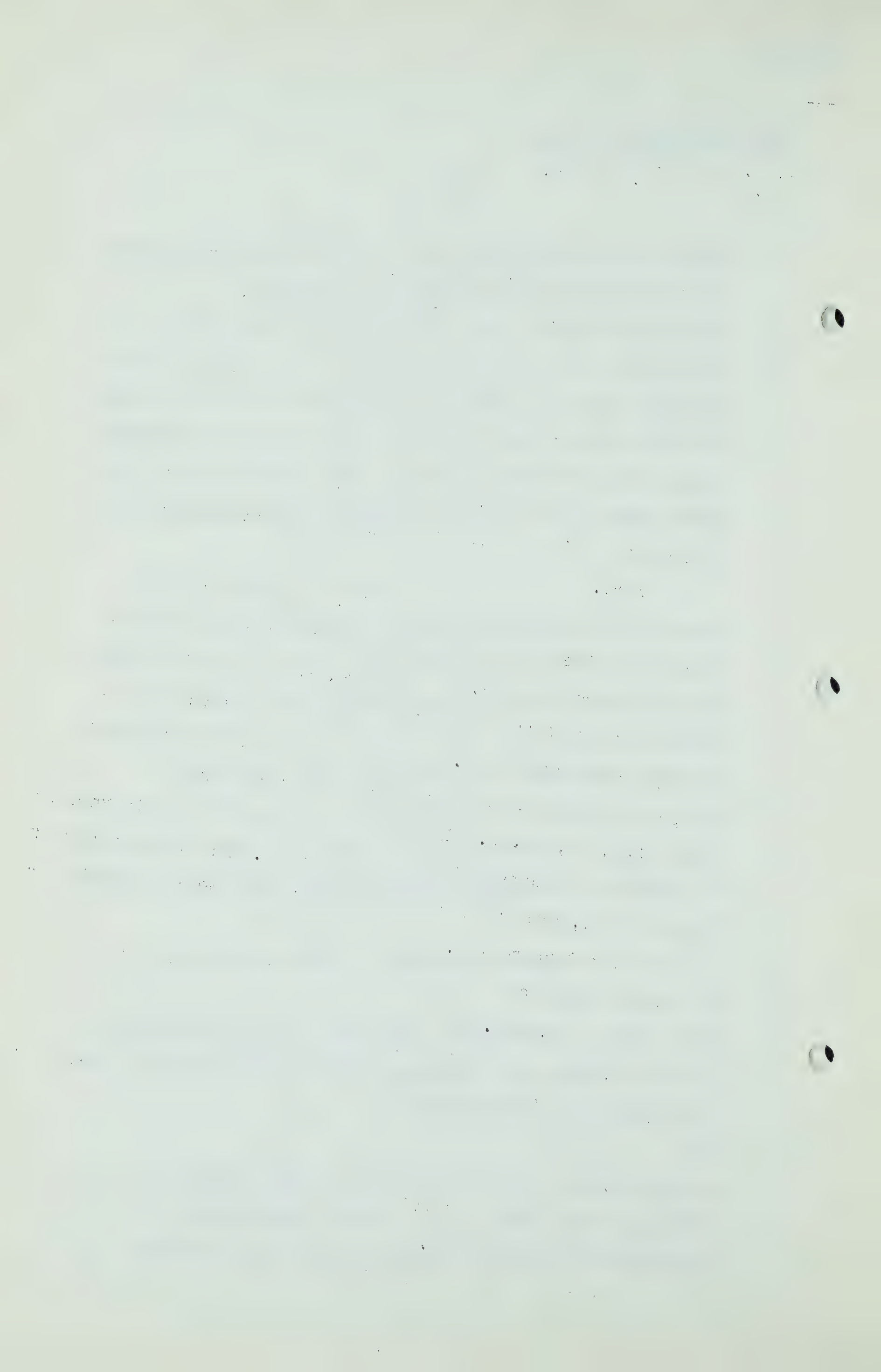
A He is, yes, sir.

Q Well, that is sufficient. Now, will you tell the Board just in a few words something of Ebasco Services Inc. It's head office is in New York?

A Yes.

Q And what type of service does this company render?

A Ebasco Services Inc. is the service organization of Electric Bond and Share Company and as such provides



A. B. Allyne,  
Dir. Ex. by Mr. Nolan.

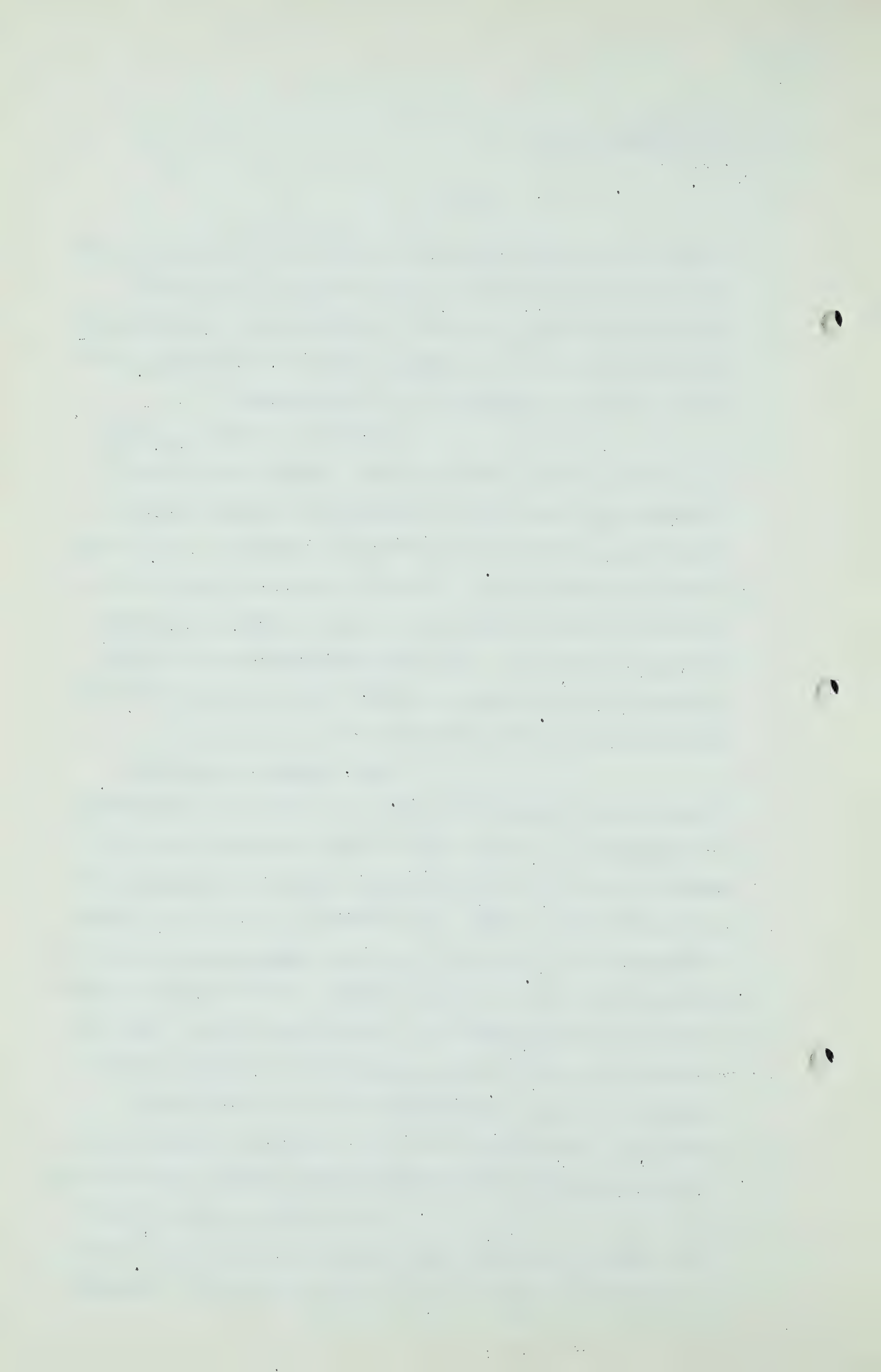
- 835 -

engineering design, construction and a wide range of business consulting services to public utility, industrial, financial and other business enterprises and to governments. At the present time the company employs 2,000 people, some 1200 of which are engineers and technicians.

The Ebasco staff is divided into three general service groups, namely engineering, financial and operating. Engineering services include consulting, design and construction, appraisal, purchasing, traffic and inspection. Financial services rendered include corporate finance, rates and prices, systems and methods, taxes and insurance. The Operating Department provides services covering sales and marketing, industrial relations, general consultation and research.

The company has prepared reports and recommendations for the construction programs of twenty-six electric companies and twenty-four gas companies involving a billion dollars of new investment over the years 1946 to 1952. The company is one of the largest designers and builders of steam and hydro-electric generating plants in the world, having designed over 3,000,000 kilowatts of new generating capacity. Work in the utility field has covered steam power plants, substations, electric transmission lines, gas transmission lines and compressor stations, hydro-electric projects, manufactured gas plants, diesel power plants and miscellaneous building construction.

In addition to its work in the utility field it renders similar services to a variety of industrial companies and foreign governments. Examples





A. B. Allyne,  
Dir. Ex. by Mr. Nolan.

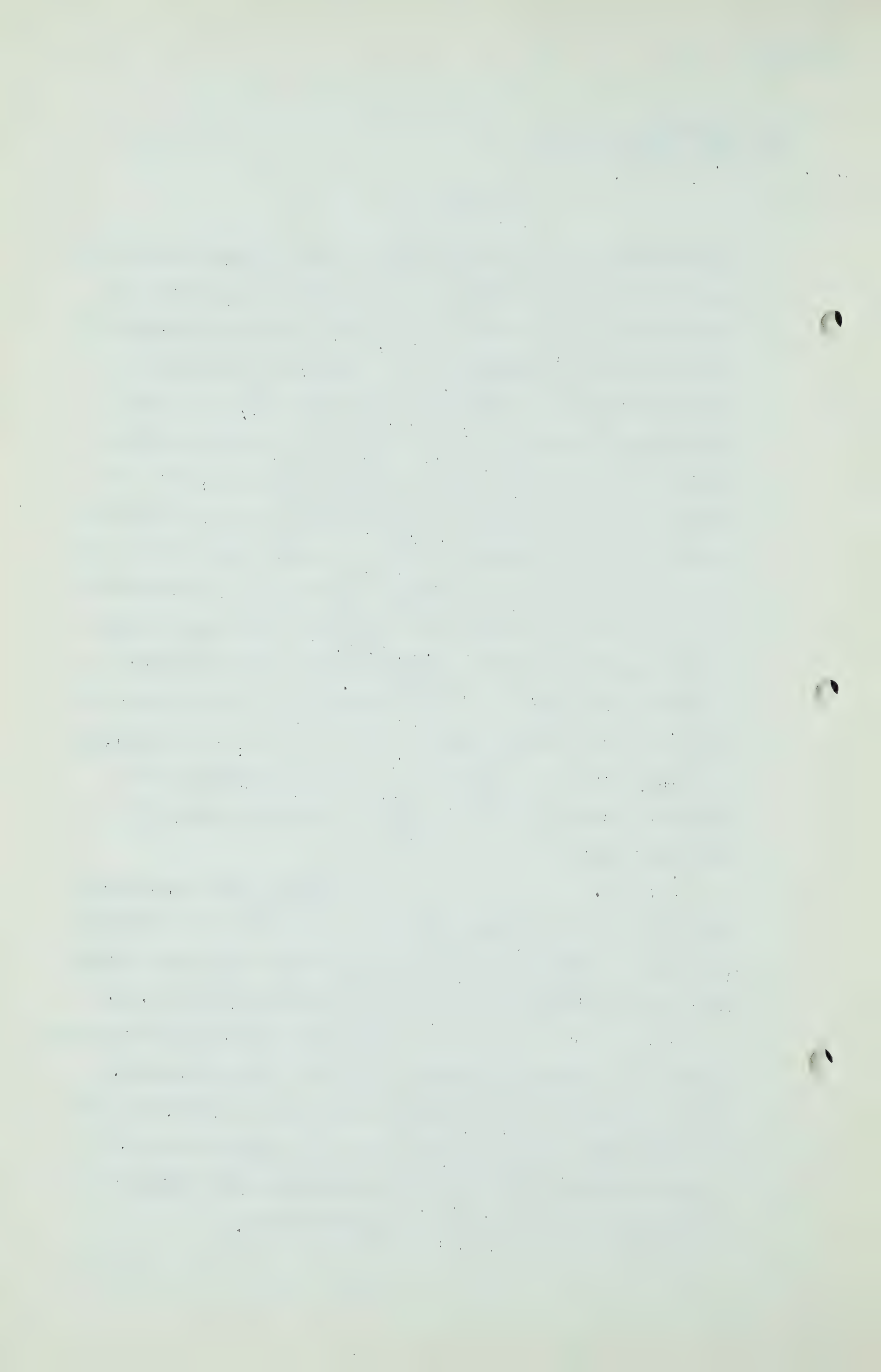
- 836 -

of its work in the foreign field at the present time are its participation as a member of the Overseas Consultants who are making an economic study of Iran, including a complete highway system, communications, transportation, public buildings, health, education, gas, power and etc. which it is expected ultimately will require an investment between six and seven hundred million United States dollars. The company is also engaged in work for the E.C.A. of the United States on a comprehensive study of present and future power and gas requirements of Greece including the potentialities of the principal rivers for irrigation, flood control and a long range hydro-electric development. Other examples of diversified projects in the foreign fields include coconut and copra processing plants in the Phillipines, industrial, townsite and port facilities in the Lake Maracaibo oil fields of Venezuela and a complete newsprint mill in Central India.

The company has participated in the design and construction of over one billion dollars worth of utility plants and at the present time has a backlog of construction orders totaling some \$233,000,000.00.

Seventeen construction projects completed by Ebasco from the middle of 1948 to November, 1949, involving construction in the amount of \$166,000,000 exceeded the estimated total costs by less than 2-3/4%. These estimates were prepared in 1947 and 1948 during a period of wide fluctuation in market prices.





A. B. Allyne,  
Dir. Ex. by Mr. Nolan.

- 837 -

Q Where are the offices of your company other than New York, Mr. Allyne?

A We have an office in Chicago. We have representatives in London, England, and we are in the process of opening an office either in Bombay, India, or Ceylon.

Q What is the relationship between your company and United Gas Corporation?

A We are connected by means of an affiliate, which has the control of the United Gas Corporation.

Q And does United Gas Corporation own a pipeline system?

A Yes. That is called the United Gas Pipeline Company, and they also own the Union Producing Company which develops gas and delivers it to the pipeline company.

Q Is that a big pipeline operation?

A Yes. I would say it was one of the largest.

Q In the world?

A In the world, yes.

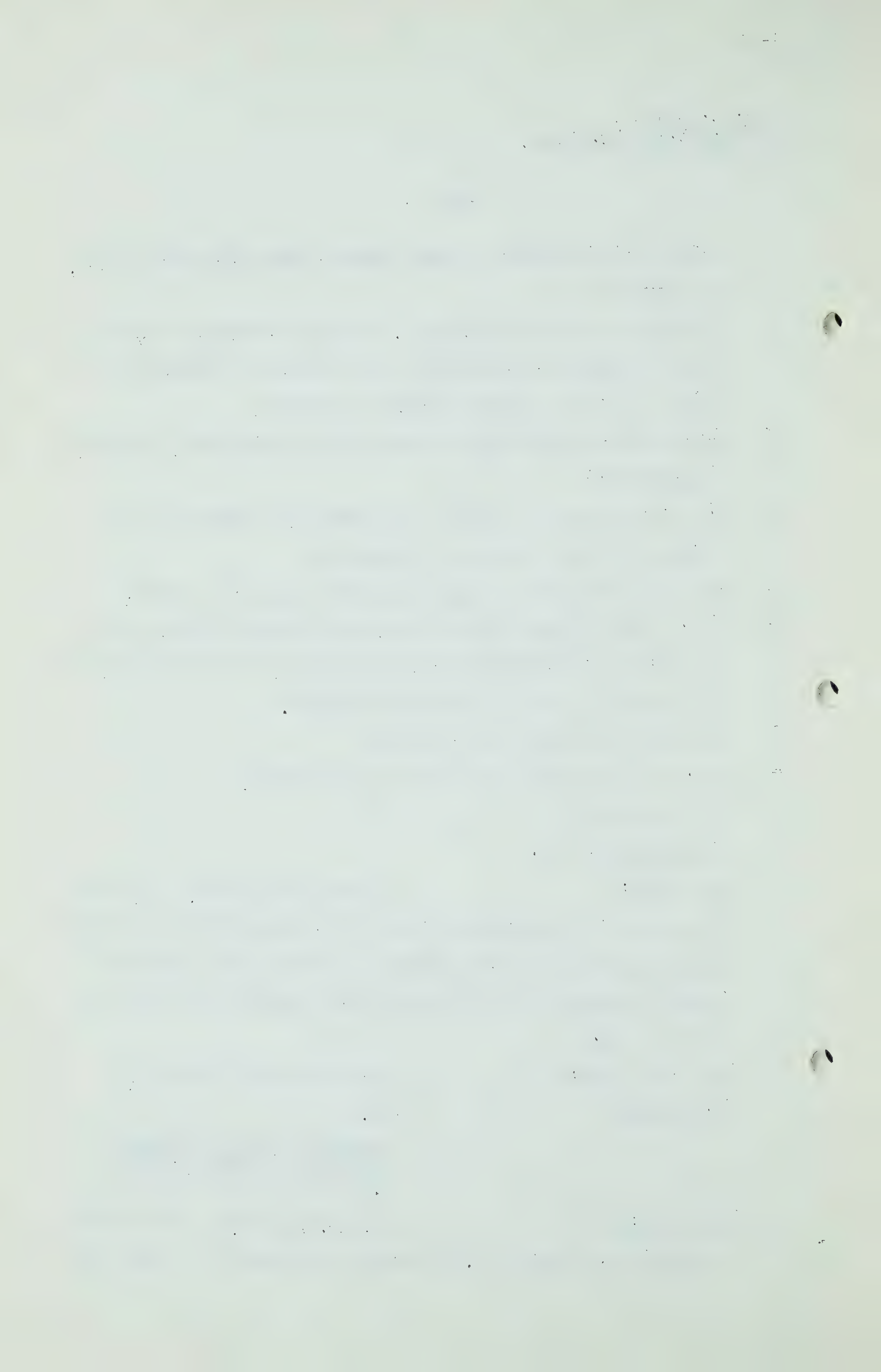
MR. NOLAN: I have been handed, sir, this portfolio of photographs which were taken and were mentioned and discussed with Mr. Goodbody. Perhaps they could be given a number now and put in so that anyone who likes can look at them.

MR. S.B. SMITH: Is this what I asked for?

MR. NOLAN: Yes.

PORTFOLIO OF PHOTOGRAPHS  
PUT IN AND MARKED EXHIBIT  
20.

Q MR. NOLAN: Now, Mr. Allyne, you received instructions, didn't you, to make an estimate of costs for



A. B. Allyne,  
Dir. Ex. by Mr. Nolan.

- 838 -

a 24-inch pipeline between Princeton and Hope and Flood in the Province of British Columbia?

A We did.

Q And that work was carried out by you and your two colleagues whom you have described to us today, namely, Mr. Bedell and Mr. Reed?

A It was.

Q And the result of your composite effort has been reduced to writing and is in the form of a submission, which is before you?

A It is.

Q And may I have this given a number, sir?

THE CHAIRMAN:

21.

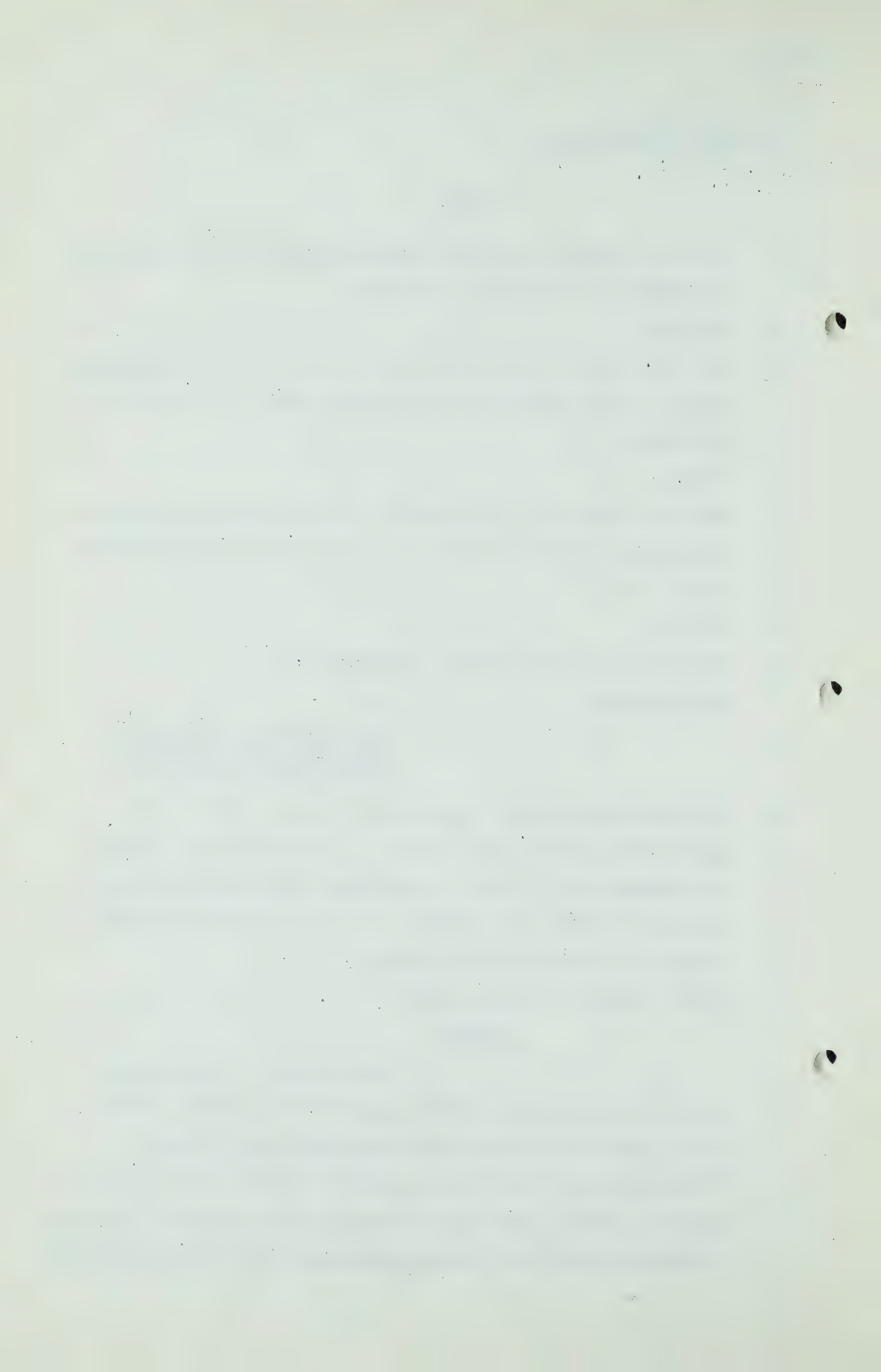
BRIEF PREPARED BY EBASCO  
SERVICES INCORPORATED PUT  
IN AND MARKED EXHIBIT 21.

Q Well now, Mr. Allyne, without more to-do, would you be good enough to read this report to the Commission, making any comment you like as you go along, and producing any material at what you consider to be the convenient moment during the reading of the report.

A I will be glad to do so, sir.

PURPOSE

The purpose of this study, as reflected by this exhibit, has been to select a route for a proposed 24-inch natural gas pipe line between Princeton, Hope and Flood, British Columbia, and to estimate what the actual construction costs, only, would be, exclusive of materials and engineering overheads. The field study and





A. B. Allyne,  
Dir. Ex. by Mr. Nolan.

- 839 -

the cost estimates have been made for the applicant by Ebasco Services, Incorporated, of New York City, New York.

THE ROUTE

The general route of the proposed pipeline is adjacent to the new highway between Princeton and Hope and the old Trans-Canada highway between Hope and Flood, British Columbia. In general, the route is almost continually in mountain ranges with elevations reaching approximately 4400 feet above sea level; and because of the many narrow mountain passes and slide areas, such a pipe line would of necessity, in many instances, have to be laid along ridge tops, on side-hills, in swamps and stream beds. The field survey and cost estimates were made during the latter part of May and the first week of June, 1950.

(Go to page 840)



A. B. Allyne,  
Dir. Ex. by Mr. Nolan.

- 840 -

Q Yes?

A METHOD OF FIELD SURVEY

The selection of a preliminary route for the proposed line was made by automobile and on foot by Messrs. A. B. Allyne, A. E. Bedell and L. E. Reed. A separate field sheet was used for each mile on the route, on which was placed a rough sketch of the line with respect to the highway and the terrain, as well as the result of a concensus of observations of the party with regard to the types and quantities of clearing, construction, ditch and right-of-way rock, stream, swamp, highway and railroad crossings, and any other special problems that would require consideration in the preparation of the cost estimates.

The notes reflecting clearing were broken down into four groups as follows:

|            |   |        |
|------------|---|--------|
| Class None | - | None   |
| Class 1    | - | Light  |
| Class 2    | - | Medium |
| Class 3    | - | Heavy  |

Similarly, the types of construction that would be encountered were broken down into four classifications as follows:

Class 1 - Minimum construction difficulty - "Easy going" on relatively level terrain.

Class 2 - Difficult construction - rough terrain.

Class 3 - Very difficult construction - ridge tops, hill sides and swamps.

Class 4 - Most difficult construction - extreme side hill and gorge work requiring special treatment.



A.B. Allyn,  
Dir. Ex. by Mr. Nolan.

- 841 -

At the completion of the field inspection of each mile of the route notes were entered on the sheet covering the tenths of miles of each classification of clearing, construction, ditch and right-of-way rock and other items mentioned above.

Also, during the field survey some 50 to 60 photographs were taken illustrating various conditions encountered along the route.

In selecting a route for the line, consideration was given not only to the problems that would be encountered during its construction but also to its maintenance in service. Every effort was made to avoid rock, moving earth or snow slides; and where it would be necessary for the line to pass through streams or swamps, for any distance, the cost of adding weights has been included.

Upon completion of the field survey, the detailed sheets covering each mile were recapitulated by miles in one large tabulation which, in turn, was further summarized into totals for the various classes of clearing, construction, etc., for the entire eighty-nine miles. This summarized data form the basis for the preparation of the construction cost estimates.

Finally, a strip map, 1' x 8' on a scale of 1" to the mile was prepared. This strip map, shown in color for the various classifications, enumerated above, shows the entire line with relation to the highway and certain land marks along the route.

I wonder, Mr. Nolan, if it would be well to pass out some of these field data at this time?





A. B. Allyne,  
Dir. Ex. by Mr. Nolan.

- 842 -

Q Yes. Now, sir, there has been referred to a strip map 1 x 8 on a scale of 1" to the mile. We have reproduced that photographically for all concerned. Unfortunately, that process does not reproduce the colour, and the colour is the key to this map. However, we propose to have the map placed before the Board in colour and I am afraid my friends will have to do the best they can with my photographic effort. Could we have a number for the map?

THE CHAIRMAN: 22.

MAP OF PROPOSED HOPE-PRINCETON-  
FLOOD PIPE LINE, DETAIL OF  
TENTATIVE PROPOSED ROUTE,  
MARKED EXHIBIT 22.

Q MR. NOLAN: Now, Mr. Allyne, what you propose to do now is to describe the strip map, or refer to some of the other spots?

A I thought I would just mention the nature of the other sheets. Have they been distributed?

Q Yes. Mr. Allyne, I have in my hand what is entitled A Recap of the Field Survey Notes.

A Yes.

Q Is that the one to which you would like to make reference now?

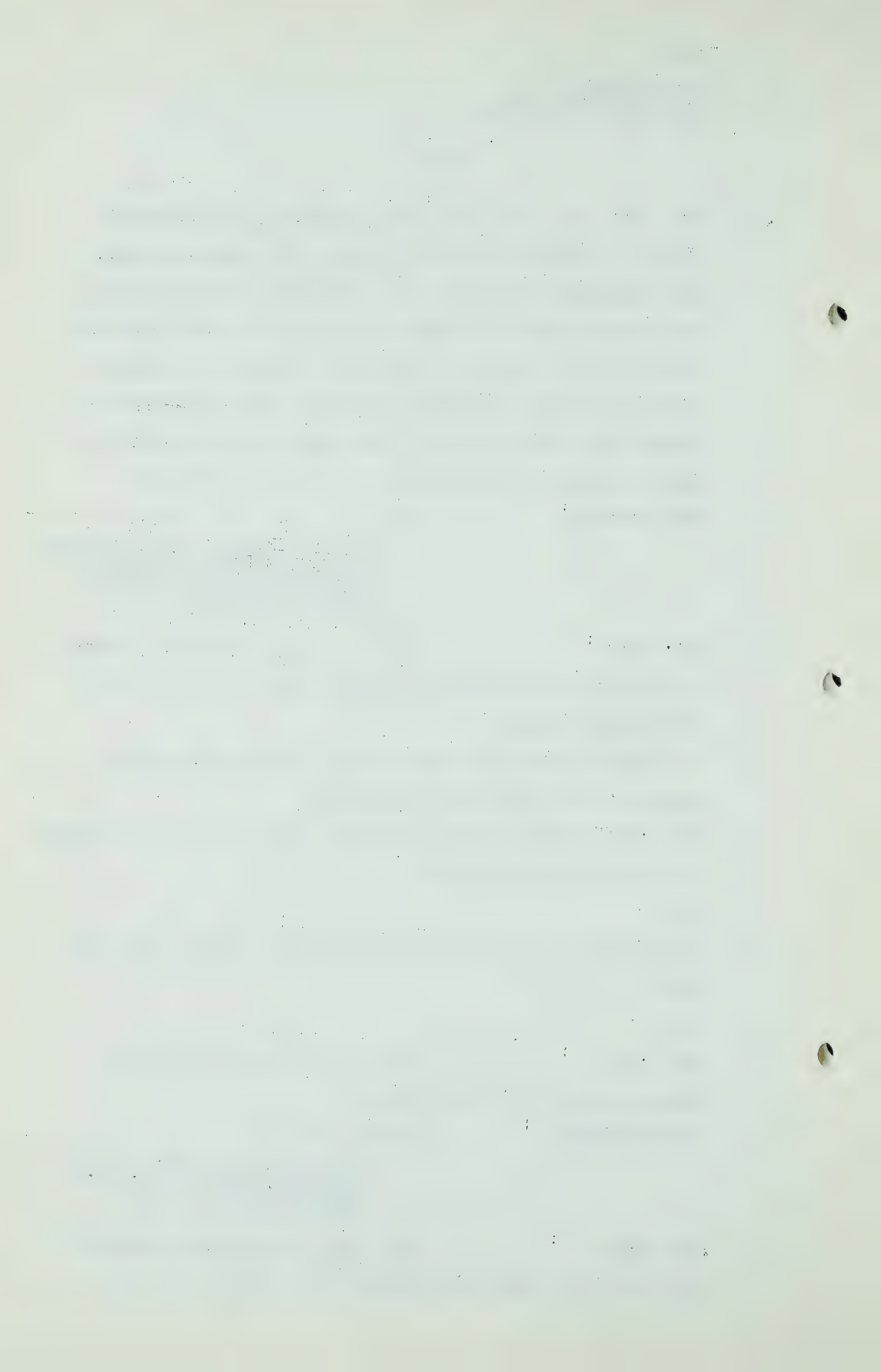
A Yes.

MR. NOLAN: And I would like to have that given a number, if I may, please.

THE CHAIRMAN: Exhibit 23.

RECAP OF FIELD SURVEY NOTES,  
SUBMITTED BY MR. ALLYNE,  
MARKED EXHIBIT No. 23.

Q MR. NOLAN: Now, would you be good enough to tell the Board what this Exhibit No. 23 is? How it was



A. B. Allyne,  
Dir. Ex. by Mr. Nolan.

- 843 -

put together, and what it portrays?

A As I stated in the text of the exhibit, we prepared some 89 field sheets, one for each mile of the area, in which we made a small sketch of the mile in question, and the line where we proposed to put it with respect to the highway, to the terrain, and also our consensus of opinion of the classifications of clearing, construction, rock and other items. The data taken on or placed on those 89 1-mile sheets was then transcribed into this large tabulation identified as Exhibit 23, so that aside from the sketch of the line it has all of the information taken on the field sheets as contained in Exhibit 23.

Q And it divides the different kinds of clearing and construction into the classes mentioned in your report?

A That is correct.

Q And it does that for every one of the 89 miles?

A Yes, sir. They are totalled at the end, at the bottom of page 3.

Q We may have occasion to refer to that again, for the present that is what it is, isn't it?

A Yes.

Q Now, you were going to refer to a document which is entitled "Recapitulation of Construction Details obtained from Field Survey"?

A Yes.

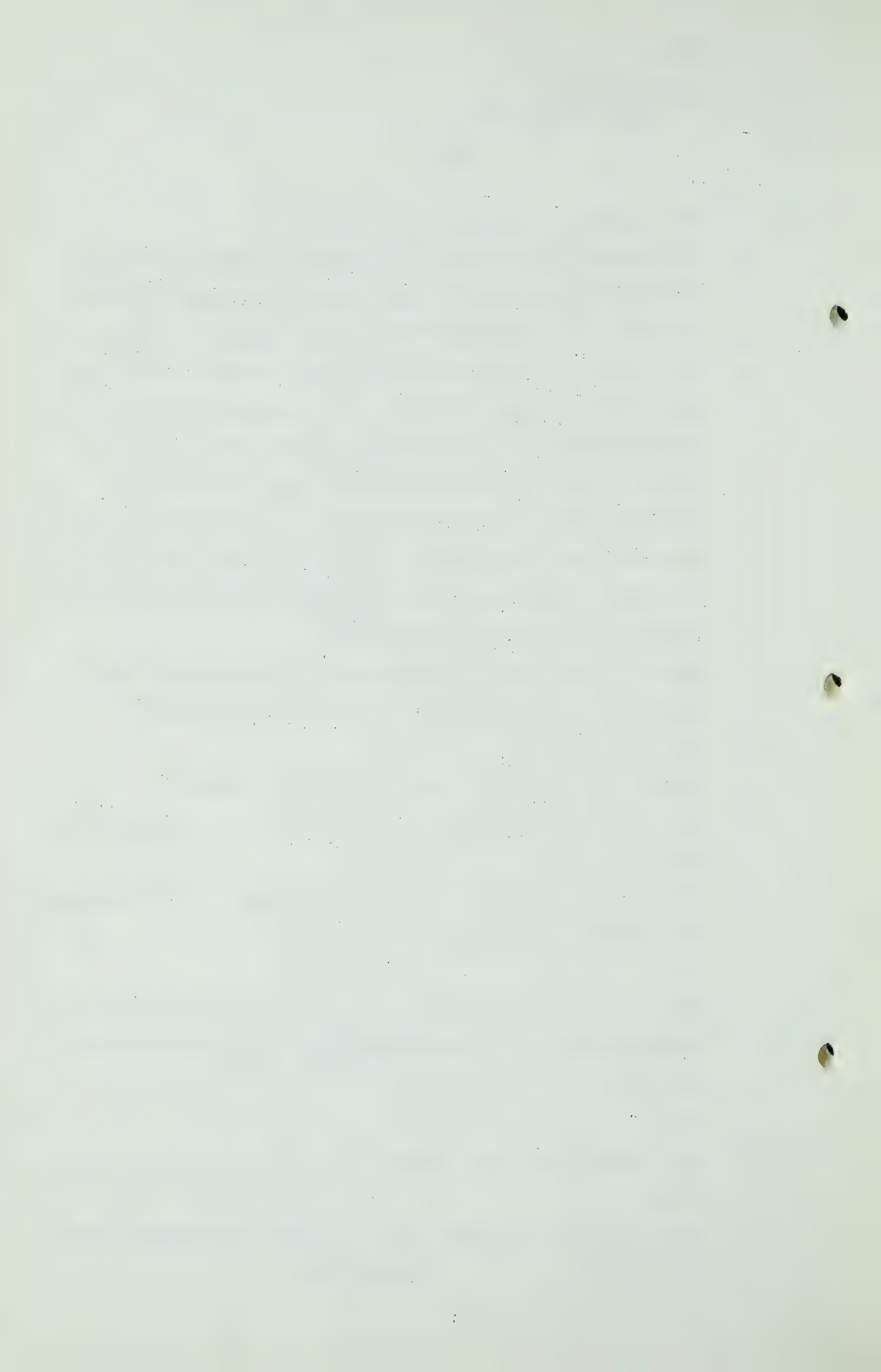
Q You prepared that, Mr. Allyne?

A I did.

Q And may it have a number, and be marked as an exhibit, sir?

THE CHAIRMAN:

Exhibit 24.



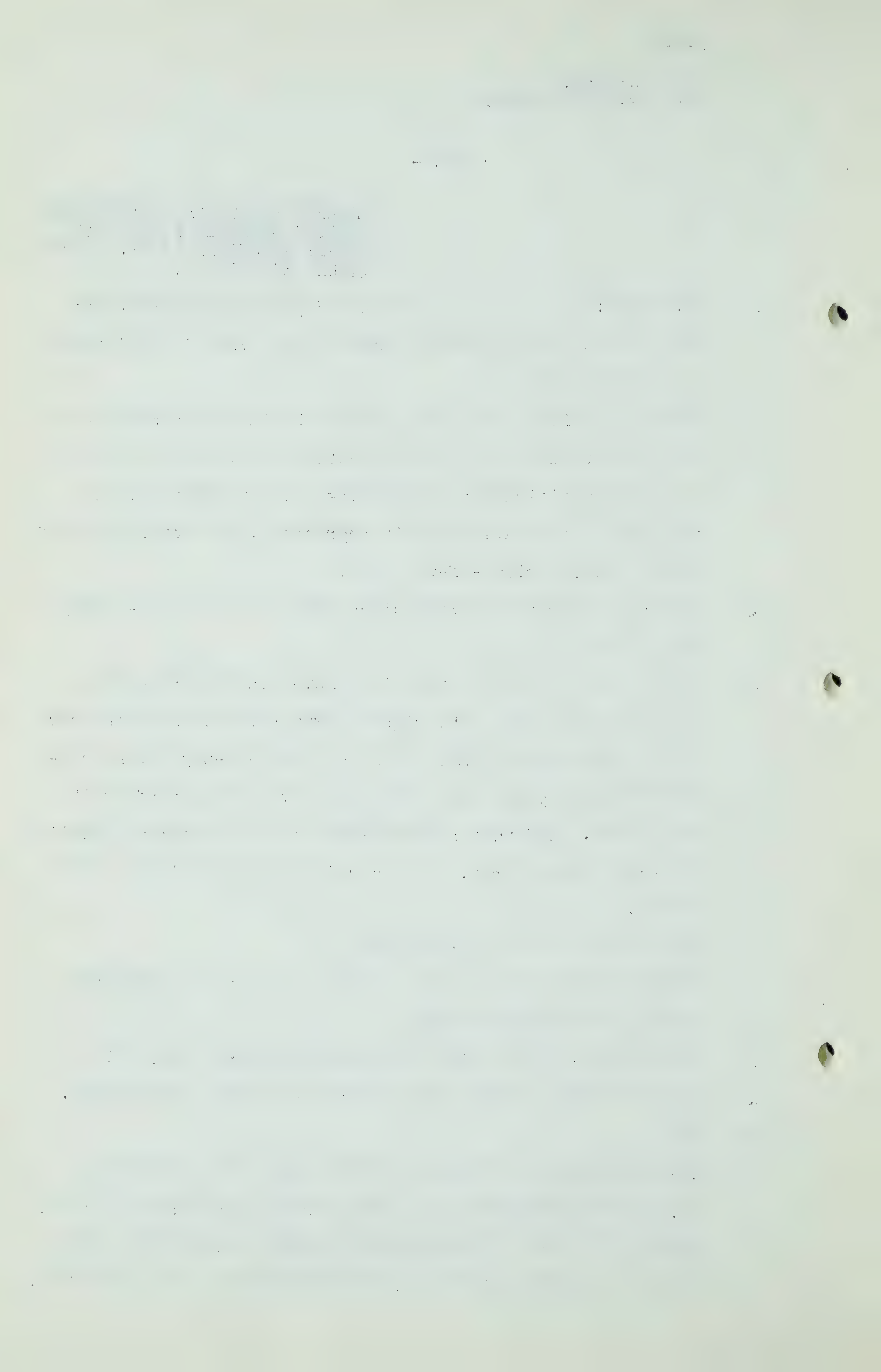


A. B. Allyne,  
Dir. Ex. by Mr. Nolan.

- 844 -

RECAPITULATION OF CONSTRUCTION  
DETAILS OBTAINED FROM FIELD  
SURVEY SUBMITTED BY MR. ALLYNE  
MARKED EXHIBIT 24.

- Q MR. NOLAN: Now, would you be good enough to tell us how this document is made up and what it is intended to convey to us?
- A Exhibit 24 simply takes the tables obtained from Exhibit 23 and recapitulates them for the entire line, as to the miles of each classification of clearing and construction, the per cent of the table that it represents, the total miles of ditch rock and right-of-way rock.
- Q And the difference between ditch rock and the right-of-way rock is what?
- A Ditch rock is the rock that is removed in preparing the ditch for the pipe. The right-of-way rock is the rock which it is necessary to remove from the right-of-way before construction equipment can either pass over it or perform its operations. And that has reference to the equipment handling the pipe particularly, which requires a fairly level right-of-way.
- Q And then you come to Crossings?
- A We have summarized the total number of feet of unweighted creeks and weighted creeks.
- Q That means anchored pipe and unanchored pipe, does it?
- A As you choose, you may use weights or you may use anchors.
- Q Yes?
- A And similarly for streams. And the essential difference is, a creek unweighted is a small creek of possibly 20 feet, which it is not felt necessary to weight it, and the creek which we weighted might be of the magnitude of 40 or 50 feet.



A. B. Allyn,  
Dir. Ex. by Mr. Nolan.

- 845 -

While a weighted stream is purely arbitrary, and is larger than a creek, and may run 100 feet wide in which we weighted it. We also show the total number of feet of swamp, which we felt would be necessary to weight in the 89 miles.

Q Yes?

A And finally, the total number of highway and railroad crossings and special features, including two bridges. I would like to turn back to Exhibit 23. I would like to make one addition on page 1, the heading on the last column on the right, after "Highway" should be a dash and the abbreviation for railroad put there.

Q So that column includes both highway and railway crossings?

A That is true.

Q Numbering 32 in all?

A Yes. And, of course, that change should be made in each individual column, on each of the three pages.

Q But the total is correct?

A That is right. It is purely a typographical error.

Q Now, do you desire to refer to the other sheet that was distributed at this time?

A No, I believe that would be in more logical sequence if we went into the Construction Cost. We do have an album of photographs, which I think the Board might be interested in.

Q Yes. Now, these were taken in your survey of the road?

A That is correct.

Q Perhaps you did not take them?

A Mr. Reed was in charge of the camera.

Q Well, these have descriptive footnotes and might be helpful. They were taken by this party on this particular survey, and





A. B. Allyne,  
Dir. Ex. by Mr. Nolan.

- 846 -

they might be given a number.

MR. S. B. SMITH: Another set of photographs?

MR. NOLAN: Yes.

THE CHAIRMAN: Exhibit No. 25.

ALBUM OF PHOTOGRAPHS  
MARKED EXHIBIT NO. 25.

Q MR. NOLAN: Have you anything to say about those?

A The photographs simply show the typical terrain along the route and certain tight areas where we expect difficulty, we have shown them in there so that everyone would be familiar with the conditions at that location, and we also intended to show photographs of what we considered typical Class 1, 2 and 3 clearing, and similarly, construction. They are purely arbitrary terms applicable to this route alone. Various classes of clearing and construction.

Q What you are saying is that they are classifications which you made up yourself for this particular route?

A Yes.

Q All right. I think we can go along with our script now. You were going to read to me the Basis of Construction Cost Estimates, were you not?

A Yes, sir.

Q All right, if you will, please?

A BASIS OF CONSTRUCTION COST ESTIMATES

The estimated cost of construction of the 89 miles of 24" o.d. pipe line, expressed in U. S. dollars, is \$4,833,750. This is the amount for which it is believed a contractor would contract to do the actual construction work only, and accordingly includes his office expenses,





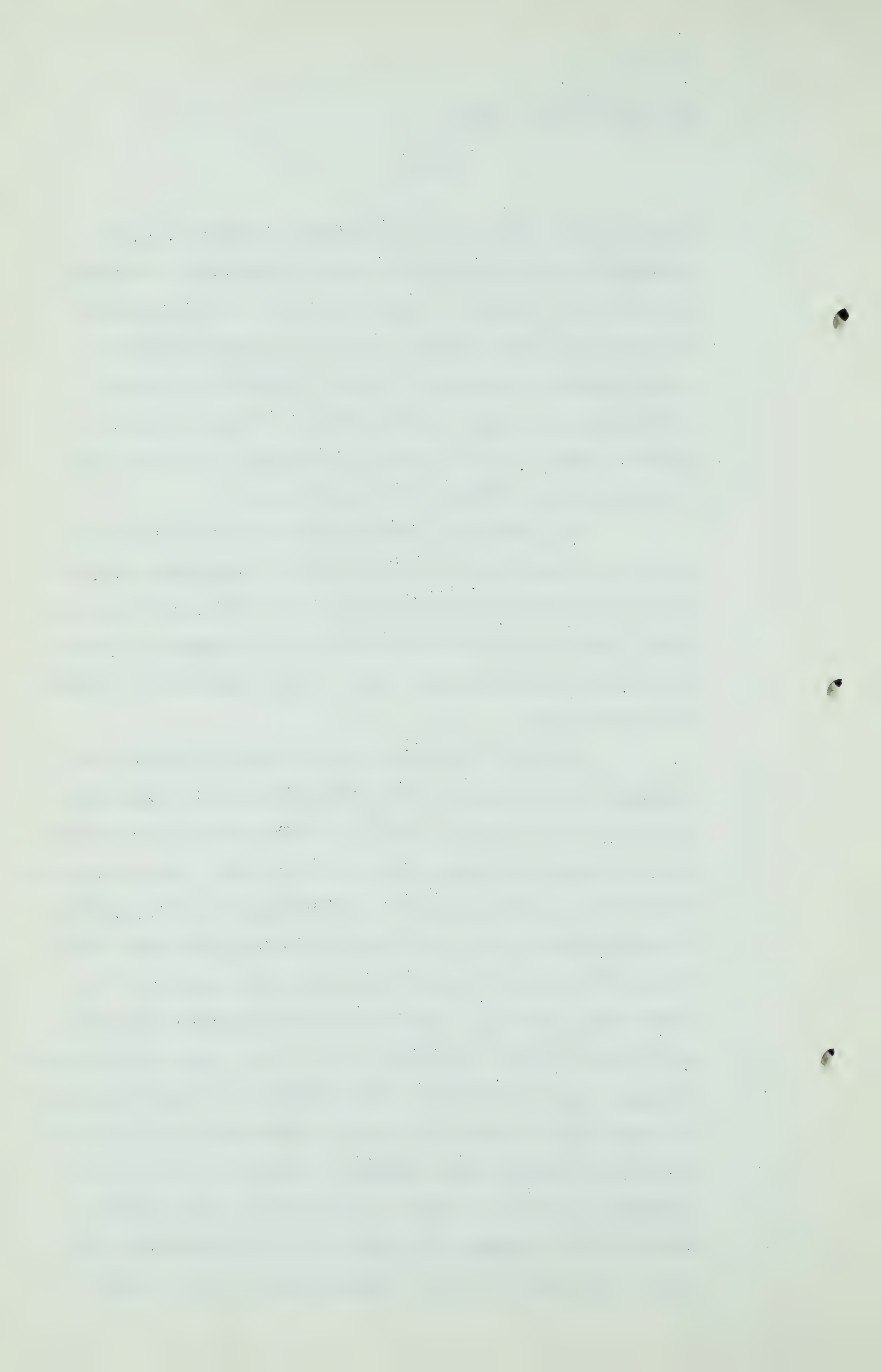
A. B. Allyne,  
Dir. Ex. by Mr. Nolan.

- 847 -

supervision, omissions and contingencies and fee, but excludes all materials which would be necessary to build the line and install its appurtenances. In addition to building the line itself, the cost estimates cover the installation of automatic valves, highway and railroad casing installations, installations of weights where required, removal of ditch and right-of-way rock, and such construction as bridges and access roads.

The basis for development of the cost estimates has been to determine the man power and equipment requirements for each operation involved in constructing the pipe line, pricing these at current rates, and assuming reasonable rates of progress per day for each operation by classes of construction.

The unit costs per mile for each class of each operation so developed were then applied to the mileages and quantities obtained from the field survey to determine the total cost of construction of the line. These steps are shown in the tabulations which form a part of the exhibit. In applying the unit costs per mile to determine the total cost of the line, it was assumed for the purpose of this study that the total length of the line between Princeton and Flood, British Columbia, would be the same as the highway mileage, namely 89 miles. The reasoning for this assumption is that while a pipe line closely following the Princeton-Hope-Flood highway would meander vertically more than the highway, it would not have to maintain the same uniform grade as the highway, and therefore could take horizontal short cuts which would be compensating to the vertical



A. B. Allyne,  
Dir. Ex. by Mr. Nolan.

- 848 -

greater distances. The exact length of the line can not be determined until a final route has been selected and the actual footage chained by a surveyor's party.

Q Now, Mr. Allyne, you have four tables attached to your report. This might be a convenient time to mention what they are. What is the first one, please?

A The first table summarizes the 7 items which go to make up the total cost of the 89 miles of 24" pipe line in the amount of \$4,883,750. By far the largest item of expense is the so-called item 1, Main Line Installation, which has a weighted composite, or the unit cost of \$40,900 is a weighted composite of the quantities of Class 1, 2, 3 and 4 construction, which are shown in the tabulation in Exhibit 24. The other items are Estimated Cost of Automatic Valve Installation, Casing Installation of Highway and Railroads, Installation of Weights, Ditch Rock, Right-of-Way Rock, and Special Construction.

Q Now, then, your second table?

A The second table, and I might say the third table also, show a breakdown of the main line installation cost of Item 1 shown in the first table, the \$40,900 per mile.

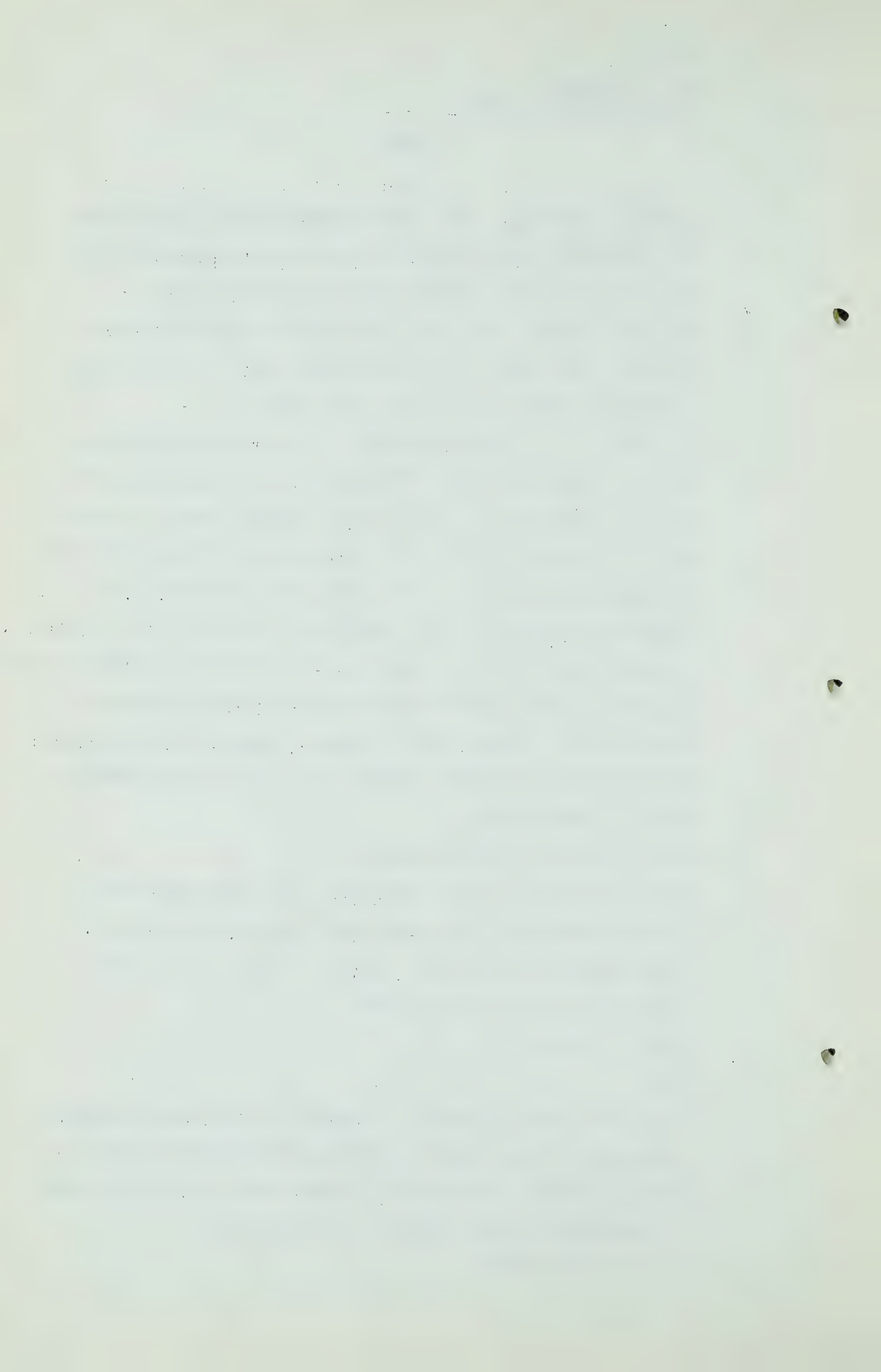
Q Which gives us the \$3,641,150?

A That is correct.

Q Yes?

A The third table is another breakdown of the same weighted unit cost of main line construction of \$40,900 per mile, giving a total of \$3,641,150, except that it is broken down by normal pipe line operations as they occur.

Q And the final table?





A. B. Allyne,  
Dir. Ex. by Mr. Nolan.

- 849 -

A And the final table, we have split up the 83 miles of construction from Princeton to Hope from the 6 miles of proposed line from Hope to Flood. The split shows that the estimated cost of the 6 miles of 24" line from Hope to Flood would cost a total of \$254,072, while the Princeton-Hope section would cost a total of \$4,629,678.

Q Now, you have not yet put in, Mr. Allyne, this other sheet that has been distributed. Would this be a convenient time to put that in?

A Yes, I believe it would.

Q It is entitled "Princeton-Hope-Flood Pipe Line Cost Estimate, Construction Only, 89 miles - 24" o.d. pipe"?

A Yes.

Q Main line installation?

A Yes.

MR. NOLAN: And that would be Exhibit?

THE CHAIRMAN: Exhibit 26.

PRINCETON-HOPE-FLOOD PIPE  
LINE COST ESTIMATE, CONSTRUCTION  
ONLY, SUBMITTED BY MR. ALLYNE,  
MARKED EXHIBIT NO. 26.

MR. C. E. SMITH: Could you give me a short title for that?

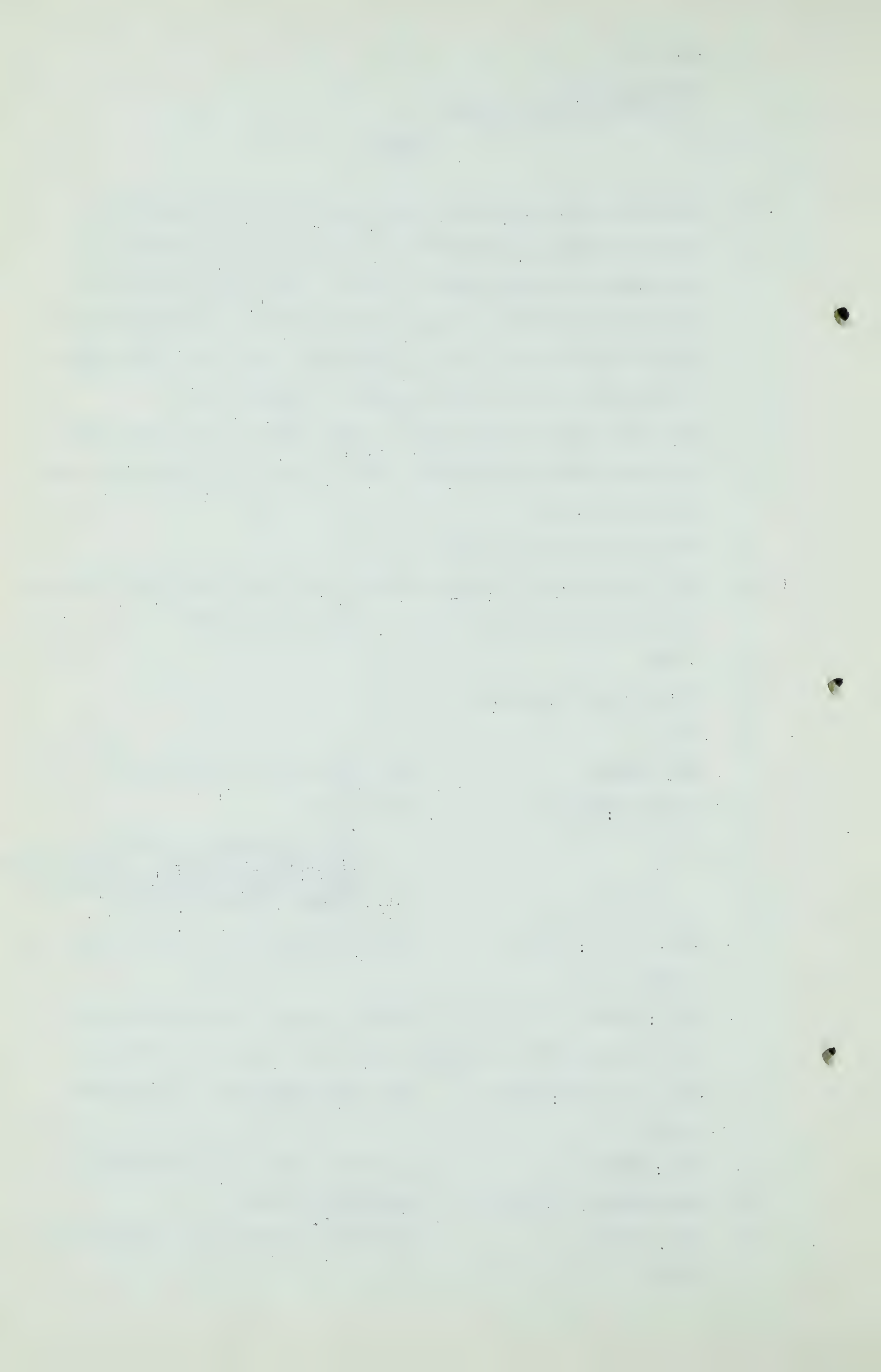
MR. NOLAN: Could you give me something that the counsel for the Board could write down in one line?

MR. D. P. McDONALD: The classification of breakdown cost.

MR. SMITH: I do not want to be difficult.

A Breakdown of Main Line Installation Cost. .

Q MR. NOLAN: Breakdown of Main Line Installation Cost?



A. B. Allyne,  
Dir. Ex. by Mr. Nolan.

- 850 -

A Yes.

Q Now, will you please describe this document to the Board, and tell them what it intends to convey?

A Well, again the tables developed in Exhibit 26, I mean, the totals, give a weighted average main line installation cost of \$40,900 per mile, or a total for the 89 miles of \$3,641,150.

Q Yes?

A This is a further breakdown of the tables in the exhibit in that it shows for each class of clearing and each class of construction the cost of the various pipe line operations per mile as estimated.

Q Yes?

A By way of clarification, I might mention that the class of construction applying to clearing and grading, I mean, the difficulties of construction applying to clearing and grading correspond to our clearing classifications, while the remainder of the classifications starting with "Ditching" refer to the construction classes, classes of construction.

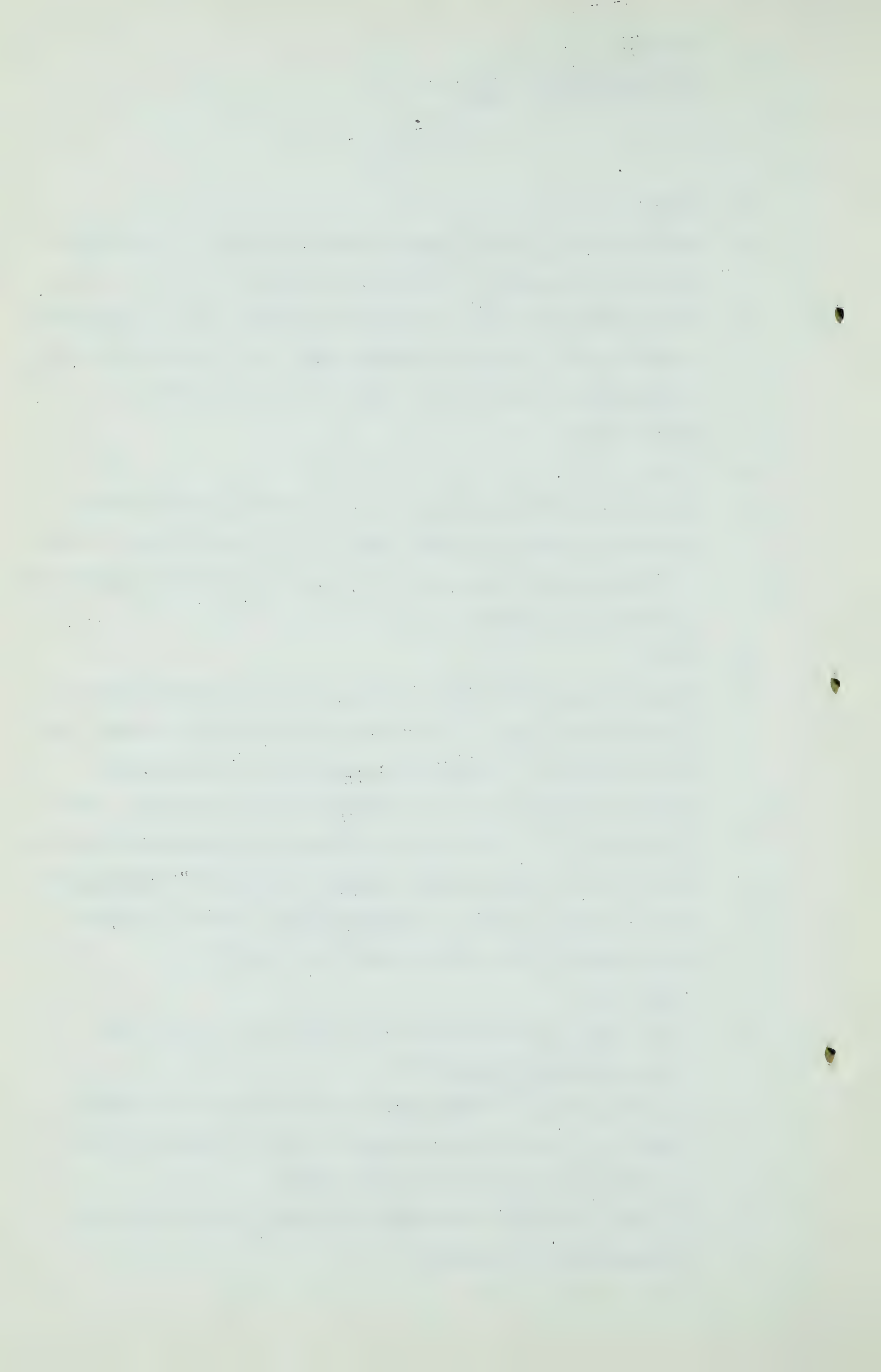
Q Now, I think a word of explanation will have to be made with regard to this strip map, Mr. Allyne?

A Yes, sir.

Q I am sorry my friends have not had it in colour, but I have already apologized.

A The strip map, in preparing the strip map we took the 89 sheets of field notes, on which we had a detailed sketch of the particular mile on each sheet.

Q So that the sheet represents 89 miles, and each mile is represented by one inch?



A. B. Allyn,  
Dir. Ex. by Mr. Nolan.

- 851 -

A The sheet represents 89 miles and each mile is represented by one inch and each inch is broken down into tenths.

Q Each inch is broken down into tenths?

A Yes. The map is to scale in that respect that the relationship - the map is to scale in that respect but the relationship of the line with respect to the highway and other land marks is not to scale.

Q It shows where the line will go, does it?

A It shows where the line will go, starting at Princeton, at mile post 83 with respect to the highway, and also with respect particularly to terrain and rivers that would require consideration in construction.

Q And also railway crossings and highway crossings?

A Yes. On the color map the pipe line is shown in red and the highway in black, so that in your particular mile, in any particular mile, you can identify the number of highway and railroad crossings. Below the strip map itself we have shown a strip in color which shows the tenths of miles in each mile and each classification of clearing, and similarly, a strip in color showing the four classifications of construction.

Q Is immediately underneath?

A Yes, is immediately underneath, and it applies in each mile taken from our field notes.

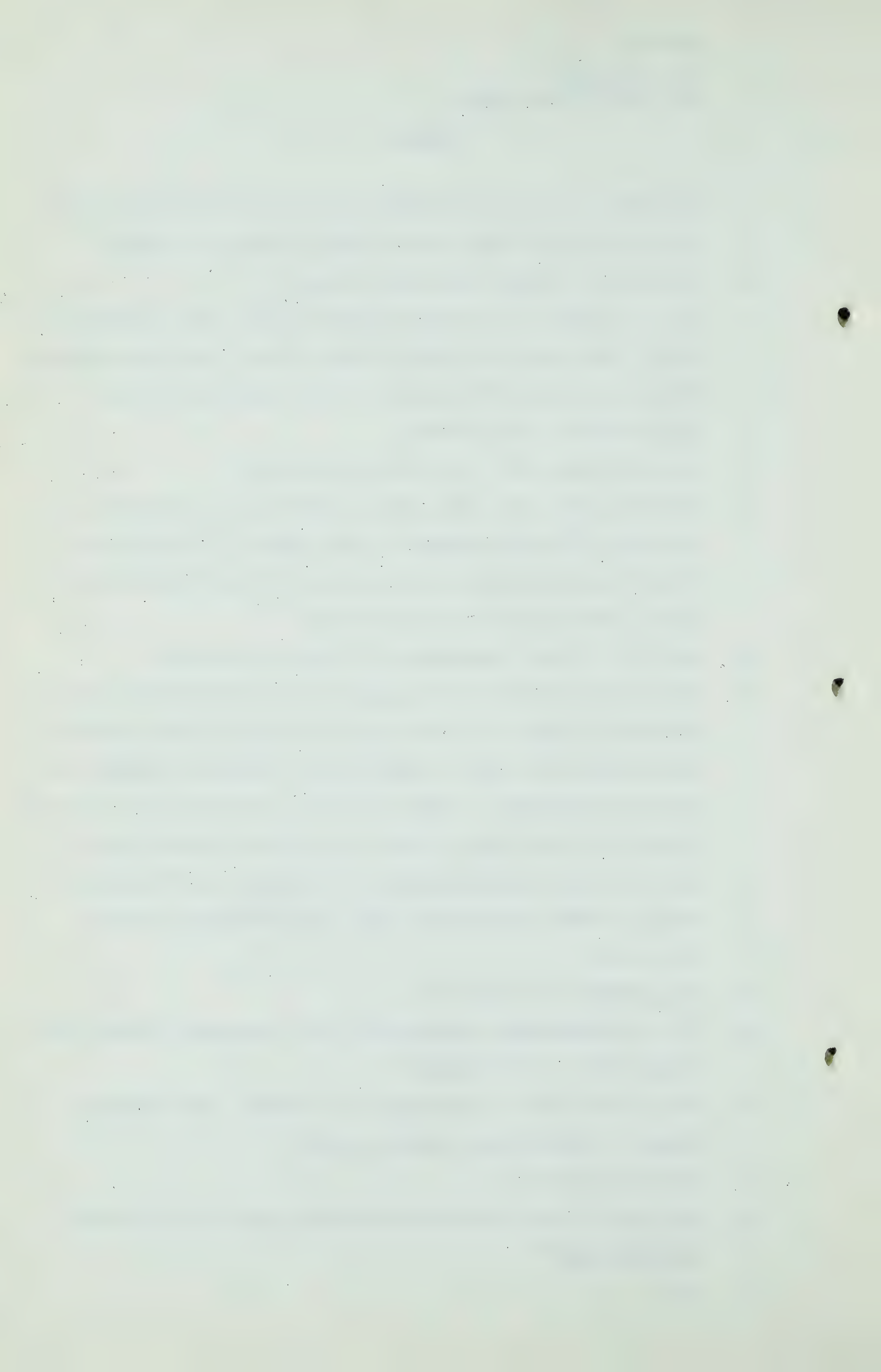
Q Now, going back to one thing for a moment. Each type or class of clearing has its own colour?

A That is correct.

Q And such of the terrain as has that class, it is coloured in that class?

A Yes.





A.B. Allyn,  
Dir. Ex. by Mr. Nolan.

- 852 -

Q So that when you see there is blue, there is none, that is right?

A Yes.

Q Class 1 is red, Class 2 is green, Class 3 is black?

A Yes.

Q Yes?

A Similarly on classes of construction, Class 1 is shown in blue, Class 2 in red, Class 3 in brown and Class 4 in black.

Q Now, below that there is another?

A Below that we have the stack chart, which shows for each mile the percentage of Ditch Rock that we determine from visual observation as we traversed the proposed route. There is scale, each small square is again 10%, and the rock figures vary all the way from zero to, I believe, 90% in one or two places.

Q Yes?

A So that when we completed the strip map we had practically everything that we had on our field notes and in our recapitulation tables of the field notes.

Q And now, down at the foot of the map, which is Exhibit 22, I see that you have a line of figures, and opposite them "Mile Post"?

A The upper line of figures represents the highway mile posts. Mile Post 0 is at Hope, and Mile Post 83 is at Princeton. From Hope to Flood, the mile posts are 98 at Hope and 92 at Flood. The line of figures immediately below the mile post figures simply shows the total accumulative miles from Princeton. In other words, starting from zero downstream and ending up with 89 upstream.



A. B. Allyn,  
Dir. Ex. by Mr. Nolan.

- 853 -

Q When you want to describe the particular terrain on one of these miles, is there any indication on this map whether it is a swampy area or whether it is a slide area?

A We have not attempted to show all of the terrain on the map. We have shown the terrain, the rivers and the slide areas, as we saw them, where their existence caused us to consider them in classifying the types of construction. We show, as I say, some of the land marks along the way, such as the top of the Allison Pass, and Mud Lake Summit, all of the measured streams that we traversed, the rock areas, any place where we are on a ridge top, we have fairly generally attempted to indicate those, and in between Mile Post 13 and about 22 we encounter quite a serious swampy area which we do not feel we can avoid.

Q When were you retained to do this work, Mr. Allyn?

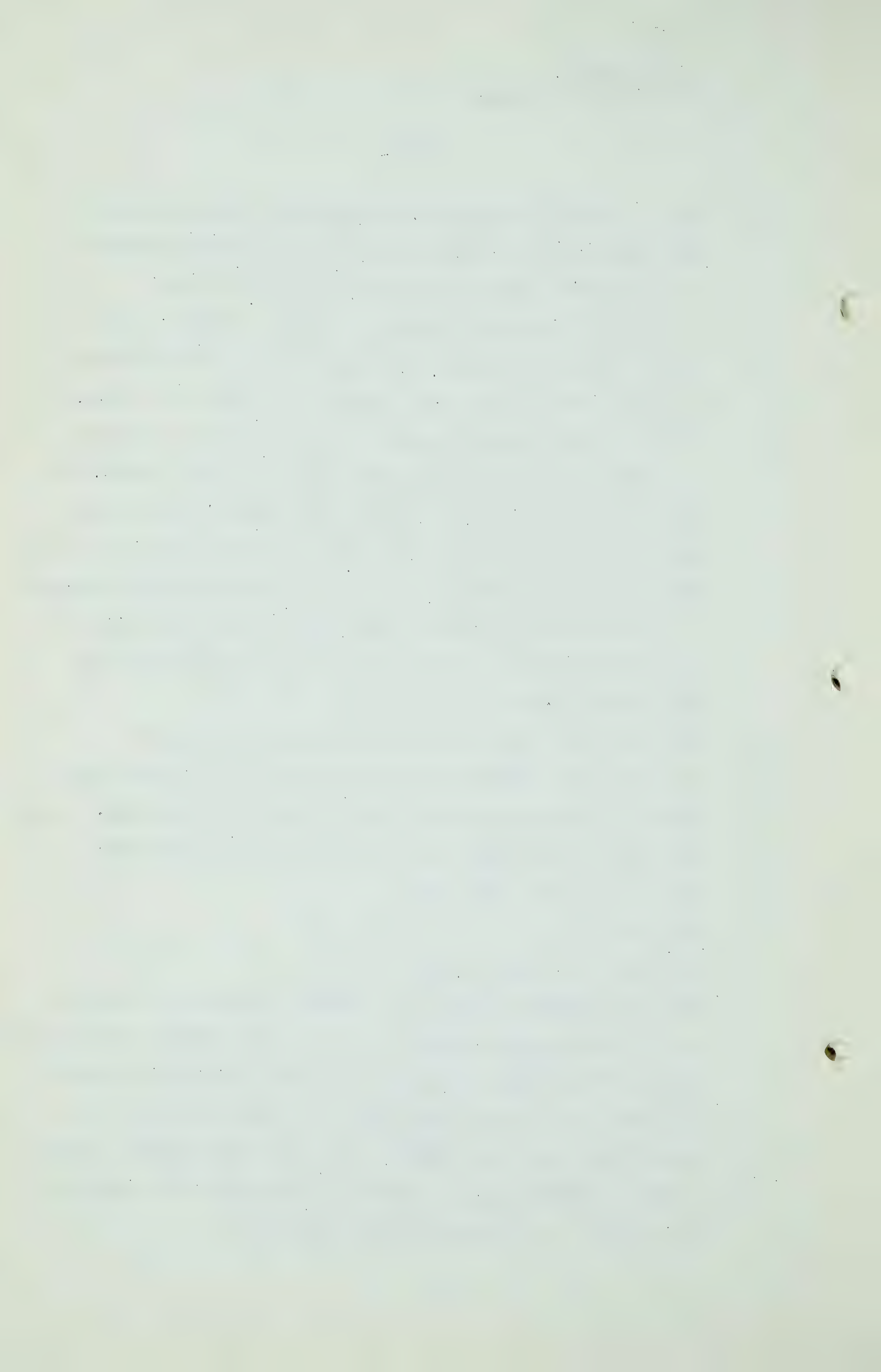
A I believe our company was retained about 4 or 5 months ago.

Q Because I observe from your report that survey was made during the latter part of May and the first week of June 1950?  
That is just the other day?

A Yes, sir.

Q Why didn't you begin before?

A Well, principally because of weather conditions. There is still a considerable amount of snow on the ground, particularly in the Allison Pass vicinity itself and there are a number of places along the highway where the snow has just been pushed back from the highway, and it is very helpful, particularly in determining the nature of the terrain and the rock conditions, to not have snow on the ground.





B-5-1

A. B. Allyn,  
Dir. Ex. by Mr. Nolan.

- 854 -

Q Well, Mr. Allyn, I see your figure is for the Princeton-Hope line \$4,629,678. How does that cost per mile compare with the normal cost per mile of construction of this kind?

A What was that figure you quoted?

Q That is the estimated construction cost of the Princeton-Hope line. It is the very last figure in the last total.

A Well that cost is about twice the normal estimated average for this type of 24-inch natural gas pipe line.

Q Perhaps I might put this to you too. How do the construction costs of those 83 miles compare with other gas lines of similar laying?

A Well I would say that those would be the most expensive 83 miles of cross-country natural gas pipe line anywhere that I know of.

Q Now, you made mention during the course of your evidence to the Board about 89 field sheets?

A Yes, sir.

Q Have you got those?

A Yes.

Q And it is from the material contained in those that all these tabulations are made?

A That is true.

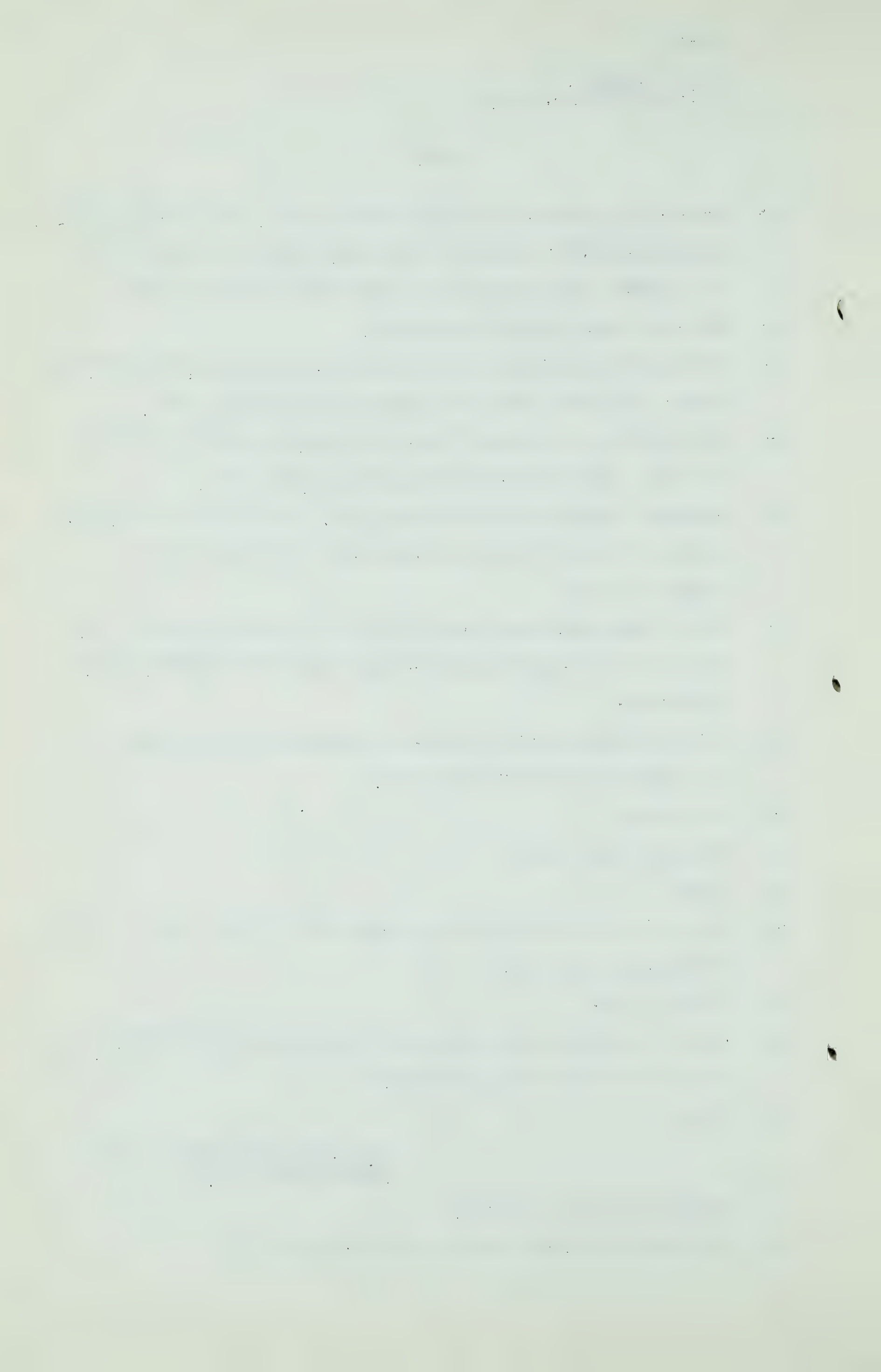
Q Well I think we will just have those marked as an exhibit, sir. There are 89 of them, are there?

A Yes.

89 FIELD SHEETS PUT IN AND  
MARKED EXHIBIT 27.

Q That is one for each mile?

A One sheet for each mile of the 89 miles.



A. B. Allyne,  
Dir. Ex. by Mr. Nolan.  
Cr. Ex. by Mr. McDonald

- 855 -

Q Mr. Allyne, in the course of qualifying yourself, you made mention of the fact that you had appeared before the Federal Power Commission on at least two occasions. That is so, isn't it?

A Yes.

Q What is the practice down there in respect of the particularity of proof required by that Commission?

A Well, we have gone to a lot more detail in studying these particular 89 miles than we normally do, or the Federal Power Commission requires. We have covered it step by step, by tenth of mile, by tenth of mile, because it is through a very rugged country and we have compiled our cost estimates in considerable detail. We normally express to the Federal Power Commission our estimates of cost per mile of total construction of main line and then any extras such as valves and highway and river crossings and so forth.

Q Now, what is the ordinary requirement of that Commission with respect to unit prices?

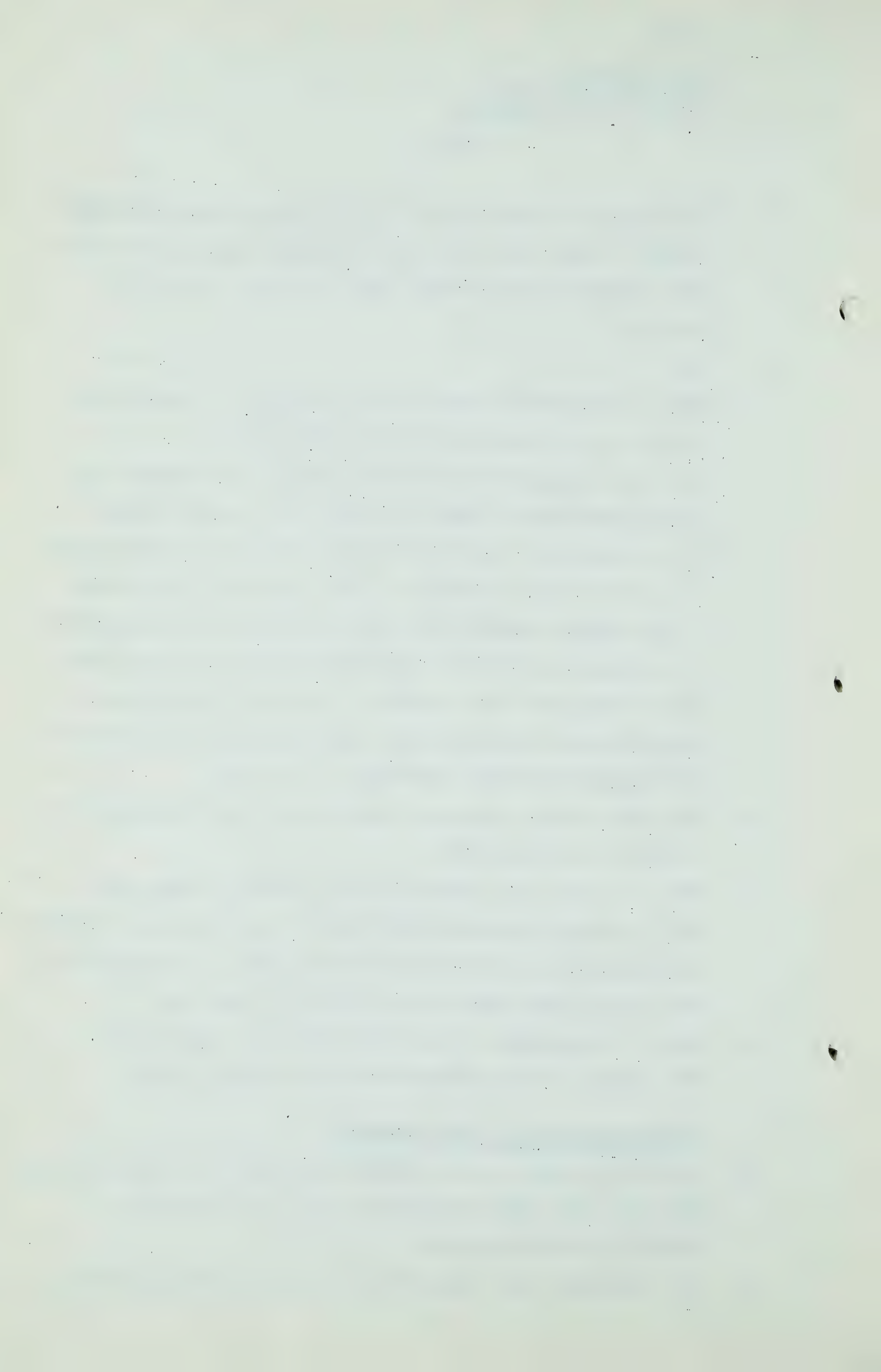
A Well, on main line construction we normally supply them with a total dollars per mile cost of construction. However, in Exhibit 26 here we have broken it down into the particular portions as they would occur during the pipe line.

Q Well, I think that is all I will ask you. Thank you, Mr. Allyne. Just answer my learned friends, please.

CROSS-EXAMINATION BY MR. McDONALD.

Q I think you told us, Mr. Allyne, but would you mind repeating, what were the terms of reference that you received in connection with this job?

A Our assignment was simply to go to the Hope-Princeton-Flood





A. B. Allyn,  
Cr. Ex. by Mr. McDonald.

- 856 -

area to select a pipe line route in that vicinity, and to prepare an estimate of the construction only portion of the cost of such a line.

Q Did you prepare this estimate on the basis of this being the entire pipe line that was to be built?

A Well, obviously, you would not have a pipe line in that territory. only 89 miles long.

Q If not, then what is the pipe line of which this is a portion? I mean, where does the original start, starting from Pincher Creek?

A Well, it would be, I believe, from my limited knowledge of their routes, a route common to any all-Canadian pipe line. I have studied none of the other routes.

Q As I read your report as a whole, I take it that you expressed the opinion of your firm that at the cost you have set out in this exhibit, that a safe and sound 24-inch pipe line can be built and maintained through this area?

A Well, let me state it this way. I do not think there is any question but what a pipe line can be built through that area. Whether it can be successfully and continually maintained is the question.

Q That is a matter of experience?

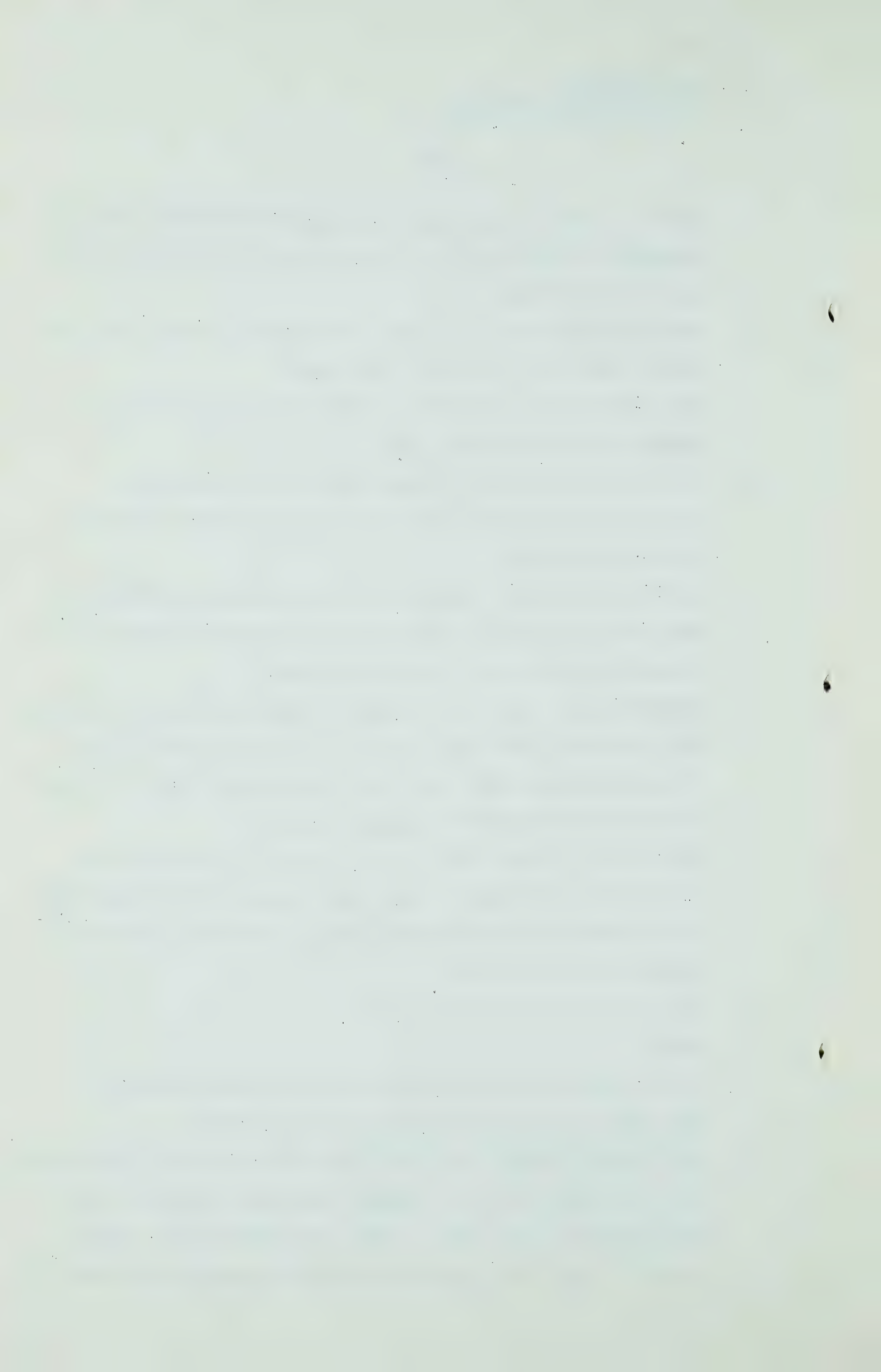
A Yes.

Q But it can be built within the costs you have estimated?

A Well those are our estimates of cost, yes, sir.

Q Now I do not intend to go into the details of your presentation, which certainly is very complete, however I do want you to tell me this, if you turn to the last page of your exhibit and see if you can enlarge on the first paragraph somewhat





A. B. Allyne,  
Cr. Ex. by Mr. McDonald.

- 857 -

for me. You mention the basis for development of the cost estimates. Now would you tell me first, assuming reasonable rates of progress per day, what did you consider in comparing your estimates was reasonable rates of progress per day?

A For the purposes of this estimate in that particular country, we assumed that in Class 1 construction, a big inch spread could make 4000 feet per day; Class 2 construction, 2500 feet per day; Class 3 construction 1500 feet per day, and Class 4 600 feet per day.

Q Now after you applied those items to the mileage, what was the total time required for either one unit or one spread or two spreads to do the job. I mean, whichever way?

A Well I have not taken a weight of the average rate of progress but if you will refer to the second table in the exhibit you can see that the general - -

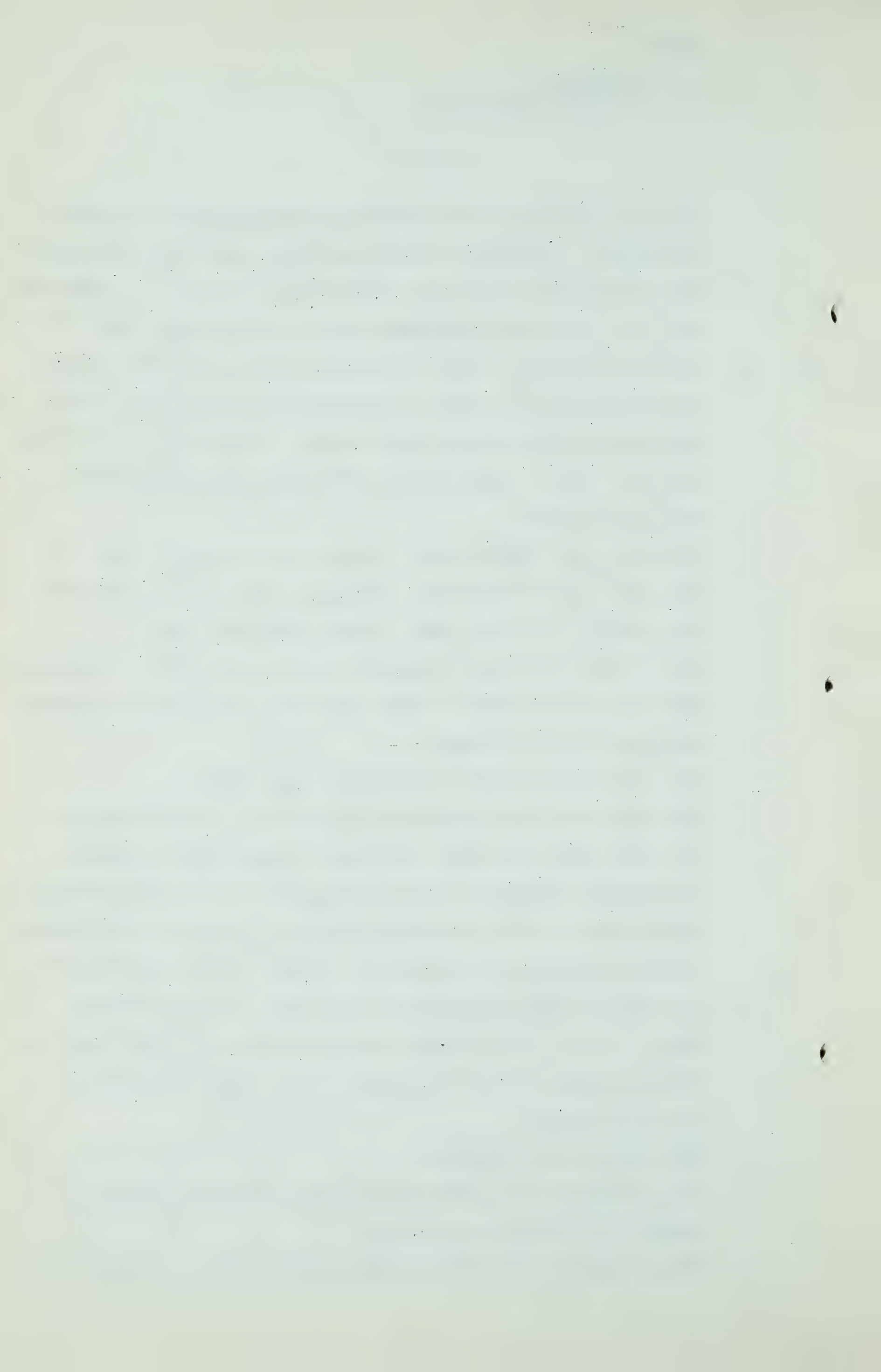
Q That would be 24 miles at 4000 feet per day?

A Well you could not calculate it but let me try and satisfy you this way. The cost for Class 2 construction closely approximates weighted cost for the whole line. It is slightly under that, so that if we had a rate of progress of 2500 feet a day for Class 2, the over-all average for the line rate of progress might be slightly over that. In other words, about a half a mile a day. In other words, it might take you, if everything fitted, some 180 days to complete the line with one spread.

Q That would be one spread?

A And I doubt if one spread would have sufficient working season to do that in one year.

Q If you had to take into account working season it might be



A. B. Allyne,  
Cr. Ex. by Mr. McDonald.

- 858 -

advisable to use two spreads?

A Yes.

Q Now then just what did you include in your spread? You mention here that the equipment requirements, now I don't want you to go into the detail of the units that are in it, but how did you arrive at a basis for estimating? Did you take the capital cost of the equipment?

A Rental.

Q Or did you take the rental value?

A Rental cost classified approximating the A.E.D. booklet.

Q And how much a month would that be, or did you take a month?

A We took the monthly rental rate and divided by 30 to get a daily rate, because our operations were built up on a daily cost, and then to that we added money for gasoline, oil and parts.

Q Now can you tell me, and I presume you have it, the daily rental rate for the entire equipment? We do not want to go into detail?

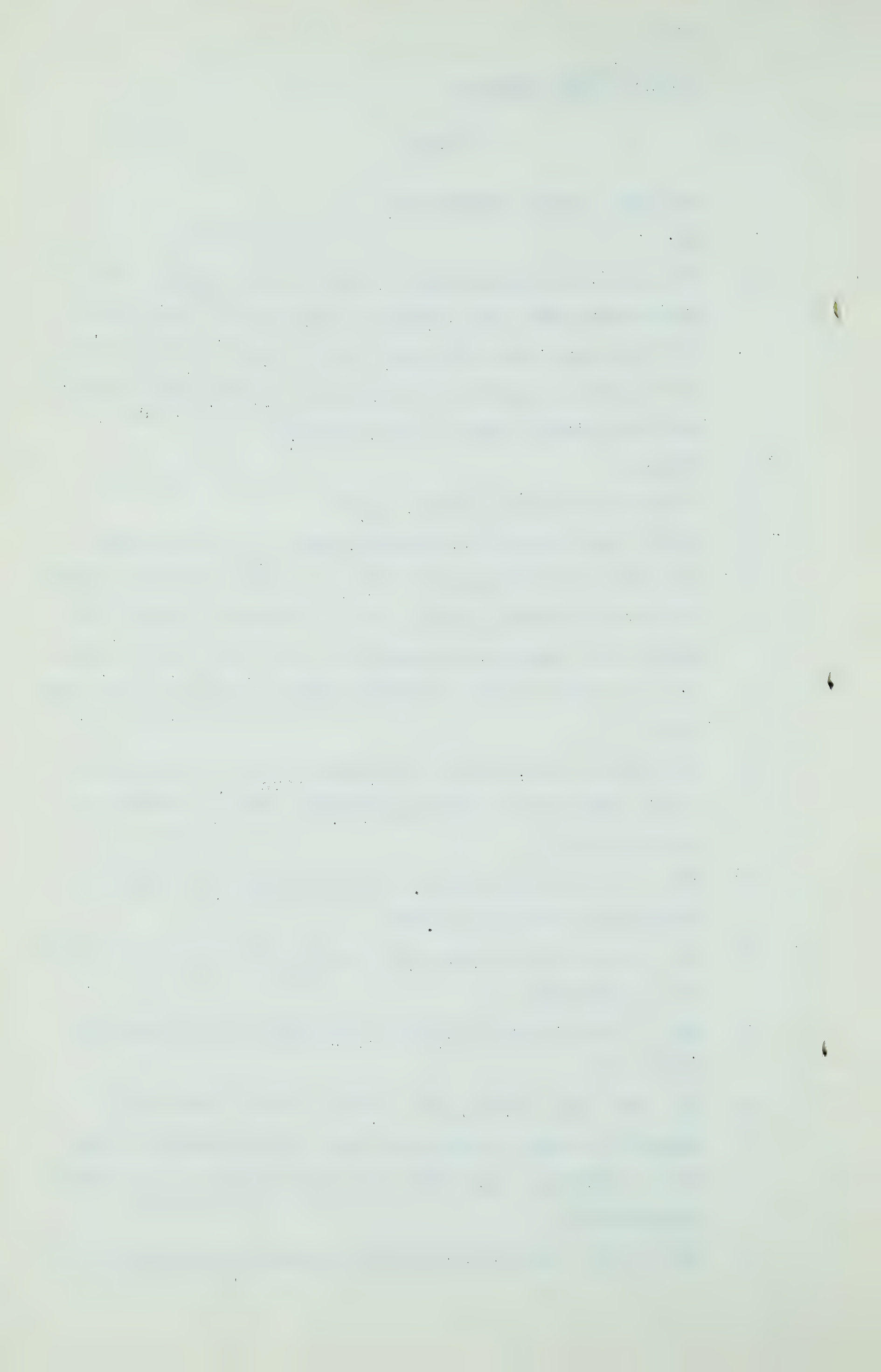
A Well, I do not have the total. I can give you typical examples of particular items.

Q No, can you tell me this, can you give me an estimate on it? Do you remember?

A Well, I say we built it up by the operations as shown in Exhibit 26.

Q No, I am just thinking, Mr. Allyne, of the rental you charged in order to get your basis for development of the costs estimates, the rental that you charged for equipment requirements?

A Well I say I have it by particular pieces of equipment for





A. B. Allyn,  
Cr. Ex. by Mr. McDonald.

- 859 -

particular operations, but I do not have it all added together.

Q Would it be much of a job to let us have them individually?

A You mean a particular piece of equipment?

Q All I am really looking for is what monthly charge or what charge did you put in for rentals against this entire job?

A The daily rate for back load draglines, tractors, cranes, including gas, oil and parts, amounted to \$40.00 per day.

Q Pardon me, \$40.00?

A \$40.00 per day each. Ditching machines we used \$75.00.

Q How many of those items did you have in your spread?

A Well I would have to go through all our detail and add them up. 3 or 4 tractors per operation and 4 or 5 back loads, and winch trucks and bulldozers and cranes.

Q Well would you go on then with your ditching machines?

A We used \$75.00 per day for ditching machines.

Q And how many ditching machines did you have?

A Two. We have winch trucks at \$15.00 per day, pick-up trucks at \$8.00 per day, bending machine at \$40.00 per day, grinding machines \$5.00 per day, welding machines \$12.00 per day,

Q How many welding machines?

A 15. Cutting and cleaning machines, \$40.00 per day each.

Q And how many?

A One cutting machine and one cleaning and priming machine, 4 dope pots, \$25.00 per day, Holiday detector, \$5.00 per day, and so on. I say those include, in addition to the rental, the gas and oil to operate them, and it is assumed that if the equipment had to come from the States that it could be brought into that area in bond and taken out again



A.B. Allyne,  
Cr. Ex. by Mr. McDonald.

- 860 -

without payment of duty. We have not any duty or anything of that nature in these costs.

Q Now have you any recollection of what the gross amount of those rentals amounts to? Does it amount of \$1500.00 a day, \$2500.00 a day, \$3500.00 a day?

A I have no way of knowing. I did not approach it from that standpoint. As you see on Exhibit 26, each operation is built up on its own merits.

Q Now could you tell me this, Mr. Allyne, what would be the value of one complete spread of equipment? Have you any means of estimating that?

A Well I would say a complete spread of equipment, in round numbers, would be somewhere around \$750,000.00. It depends on how many wagon drills you have to have and so forth.

Q Well now do you think that your composite rentals that you have taken, you referred to some rating standard that you used, does that amount to 10% per month over-all, do you think?

A I do not know, sir.

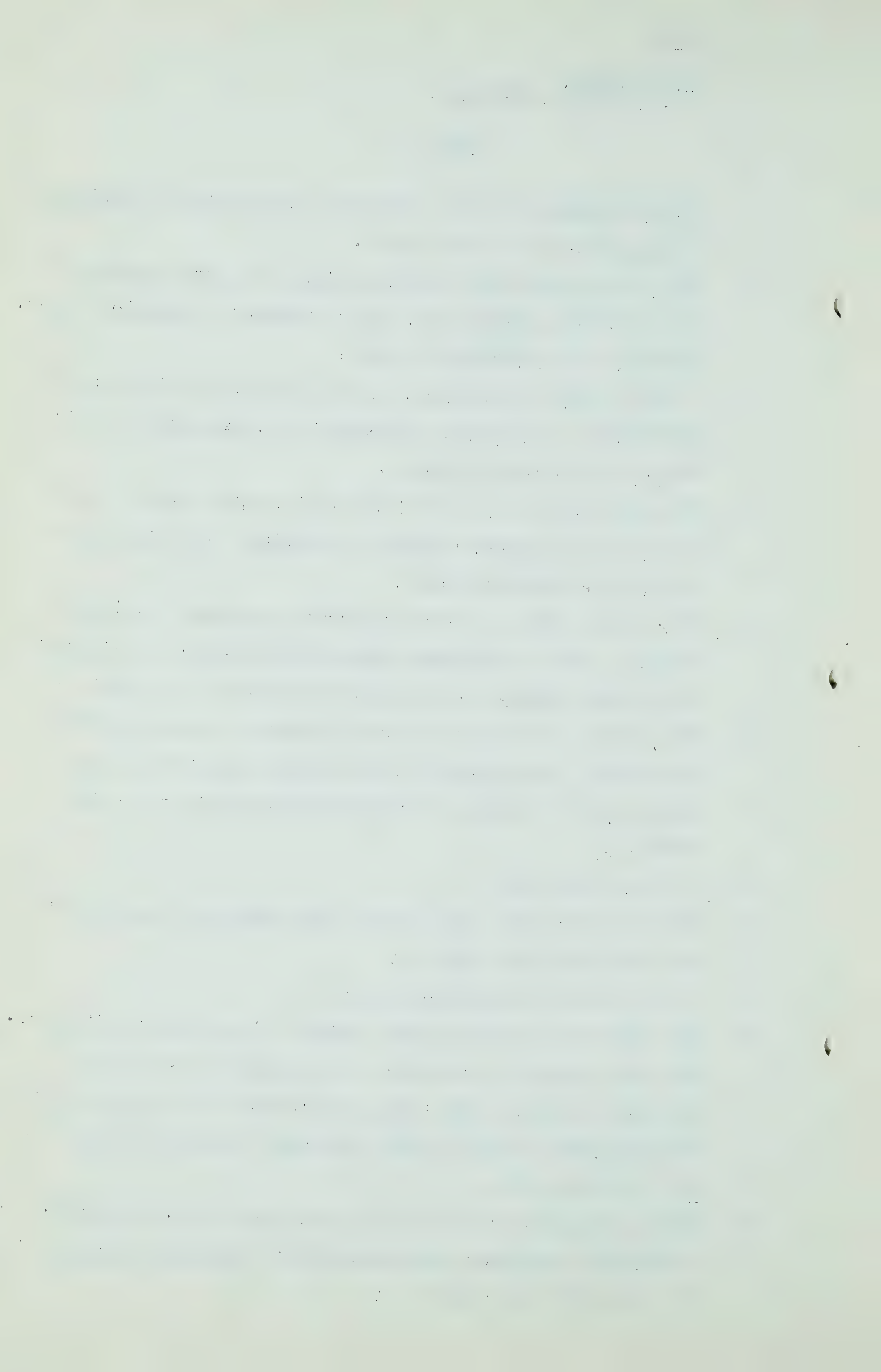
Q Well don't you rate each one of those things in order to get your \$40.00 per day?

A I told you how we arrived at it.

Q You told me you took 30 days' rental and divided it by 30, you took a month's rental out of some standard book and divided it into 30 days. Now can you recollect whether the over-all would be 10% or 15% or whether it would be 25%?

A No, I have no idea.

Q What I am trying to say to you, Mr. Allyne, would \$75,000. a month for equipment requirements be a reasonable charge for this particular job?





A. B. Allyne,  
Cr. Ex. by Mr. McDonald.

- 861 -

- A I say I approach it from that way, and if I added all these totals I could tell you, but I have not done that.
- Q There is the other item you mention here, which is man power. Now I take it that means labor, does it not?
- A Yes, sir.
- Q Now will you just tell us what was the labor requirements for the entire job per day or per month, whichever way you have it?
- A Well, we have handled labor the same way we have handled equipment, we have charged so many men of each classification to each operation at a daily rate, and got the total in dollars for labor and equipment for that operation per day. We have used existing rates.
- Q I mean, all I want to do, Mr. Allyne, is try to get these unit costs down to something I personally understand, and maybe somebody else in the room. Did you have a standard wage rate per day for mechanics, for instance?
- A Yes. We have a standard set of rates for each type of man on the job. Would those be helpful to you?
- Q Yes, if you could read them off?
- A Well there are some 15 or 20 different classifications here.
- Q Just give me the highest rate that you have got there for mechanics, or the highest rate per day?
- A Well we have Master Mechanic at a thousand dollars per month.
- Q That is \$30.00 per day, roughly?
- A \$33.00 a day, something like that.
- Q How many Master Mechanics would you have?
- A I would have to go back to all my detail sheets.





A. B. Allyne,  
Cr. Ex. by Mr. D.P. McDonald.

- 862 -

Q What is the next lowest?

A Well, let me add the same rate. Welding foreman, \$33.00 per day; General foreman, \$30.00 per day; Sub-foreman \$2.00 per hour; Welder, \$2.50 per hour; Equipment operators, \$2.00 per hour; Semi-skilled labour and truck drivers \$1.50 per hour; Common labour, \$1.00 per hour; Line mechanics \$2.00 per hour. And then we have office help such as office manager and timekeeper. I presume you are not interested in that. Then we have assumed a 10-hour work day with 11-hour pay, or 70-hour week with 85-hour pay. In other words, the basis of that is, the first 40 hours of regular time, the next 30 hours per week at time and a half, 7 days per week.

Q I am wondering if you could do this, Mr. Allyne, I think I have indicated to you what I would like to have with regard to your equipment requirements and man-power. What I really want is the gross overall figure of rentals that you charged this job for equipment. I mean, all the equipment that you are going to put into it, and I want the gross overall labour charge that you charge per month for it. I was wondering from the material you have if you could prepare a statement, say this evening or this afternoon, and let us have it in the morning.

A It can be prepared subject to counsel's wishes.

MR. NOLAN: Well, counsel does not wish you to prepare it, and we will only do it if directed by the Board. We come, sir, with vast material in this case.

THE CHAIRMAN: I think I agree with Mr. Nolan, Mr. McDonald, that you have been supplied with detail, I



A. B. Allyne,  
Cr. Ex. by Mr. D.P. McDonald.

- 863 -

think, that is sufficient.

MR. D.P. McDONALD: I appreciate that material has been furnished but it has been prepared - -

THE CHAIRMAN: It is on the unit cost basis. You can criticize the unit cost but I think sufficient information has been supplied to you.

MR. D.P. McDONALD: Be that as it may, whatever the Board wishes is quite all right with me. I think I have a great deal of the material I require on the record now.

Q There was one other item, Mr. Allyne, along the same line. You have this amount as the amount which a contractor would contract to do the actual construction work only, and it includes his fees, office expenses, omissions and contingencies, taxes and insurance. Now, am I right in that arriving at the basis for the unit cost you worked out the equipment requirements, the man-power costs, and then to that you added some percentage, did you?

A That is correct.

Q What was that percentage to arrive at your contractor's income?

A We added to the contractor's fee expense 5%, we added 5% for his omissions and contingencies, we added 15% for taxes and insurance, and 18% as fee.

Q Now, there was one other item I was going to mention. You have \$100,000.00 move-in and move-out fee?

A Yes, sir.

Q What point of departure in the United States did you have in mind?

A That is purely a judgment figure.





A. B. Allyne,  
Cr. Ex. by Mr. D.P. McDonald.

- 864 -

Q Hypothetical?

A It is a small part of the cost and at this stage of the game there is no way to estimate where the equipment would come from. It might come from Canada.

Q But you had in mind it would include all of the full spread?

A Yes, the full spread. That is higher than the normal figure to move in and move out, but it is such a small percentage of the total and not knowing where it was coming from we put in a safe figure.

Q Now, are you familiar with the pipeline construction job in the United States which was generally known as the toughest inch?

A Generally familiar with it, yes.

Q Have you any idea of the rates of the unit cost or rate per mile of the construction of that particular piece of line? I understand it was about 120 miles long.

A That is about right. I have seen moving pictures of the line. I have heard gossip, to use the phrase, that the line was constructed at about \$8.50 a foot but I have no verification of that. I understood that the line went for \$8.50 per foot, the contracting part. Then when they got into tough going some of the coating on the line was eliminated, so that the contractor got the benefit of that reduction in the amount of work. As I say, I can not verify that. This line here, the Hope-Princeton line, totalled \$4,629,000.00 and some odd dollars and figured out about \$56,000.00 per mile, which is \$2,330.00 per inch mile, which is about what we normally hope to build a pipeline complete including material for in pipeline country.



A. B. Allyne,  
Cr. Ex. by Mr. D.P. McDonald.  
CR. Ex. by Mr. S.B. Smith.

- 865 -

By that I mean Central and Southwestern United States.

Q \$8.50 per foot that you mention, was that for installation cost or was that installation plus all materials?

A Just the contracting operation.

Q Just the contract to do the labour?

A Comparable figures, yes. This is about \$10.00 a foot.

CROSS-EXAMINATION BY MR. S.B. SMITH:

Q Mr. Allyne, you were on this section of the road, that is the Hope-Princeton road, just lately?

A Yes, sir, within the past week.

Q And did you run into any slides or difficulties of that kind? You would travel over it by motor car, I presume?

A Motor car and foot.

Q Did you run into any slides?

A Yes, they are doing a lot of work at Flood right now. I drove through there last Monday and we were held up for about an hour there while the back-loads were excavating some slides.

Q From the highway, you mean?

A The slides had been shot. I mean, they were not natural slides. The Highway Department is widening the highway at that point and the highway was completely covered. We had to go around on the railroad tracks. Then, as Mr. Goodbody said this morning, in my opinion the most serious slide to the Highway Department at this time is that about Mile 2.3 where the slides are not only continuing on the up-side of the highway but the lower side of the highway, which comes

1911

1911

1911

1911

1911

1911

1911

1911

1911

1911

1911

1911

1911

1911

1911

1911

1911

1911

1911

1911

1911

1911

1911

1911

1911

1911

1911

1911

1911

1911

1911

1911

1911

1911

1911

1911

A. B. Allyne,  
Cr. Ex. by Mr. S.B. Smith.

- 866 -

down into a rather deep gorge is sloughing off badly. It extends over several thousand feet there. I think those pictures illustrate that. They are going to have to do a lot of work there in the next year.

Q Could you identify the picture that you have in mind?

A Surely.

Q Could you mark it some way, or is it numbered?

A It says: "Slide at Milepost 2.3", in this picture, and the same thing on this picture where it is a view of the same thing.

Q On the next page?

A Yes, those two pictures.

Q Well, did you run into any obstacles on the road which were the result of a natural slide, not an induced slide?

A Yes.

Q Were you held up for that kind of thing?

A No, the highway is sufficiently wide there that we were able to get around it.

Q Well, what was there on the road there?

A At Mile 31 we have a picture of what we call a typical recurrence slide in which it has continual rock falling on the highway and they are gradually widening the highway so that we were able to get around it.

(Go to page 867 )





A. B. Allyne,  
Cr. Ex. by br. S. B. Smith

- 867 -

Q And the big boulders never did come down?

A Not at that particular point.

Q At some point?

A At Flood there were very large boulders in the highway which the back load could not handle.

Q How big were they?

A They were at least twice the size of an automobile. This one that I had particularly in mind was in the middle of the highway and they were drilling that particular boulder to shoot it.

Q Now, in relation to that particular rock on the highway, twice the size of a motor car, where would the pipeline route be in relation to where that rock was, or the boulder was on the highway, would it be above the highway?

A Well, the rock we were discussing would be right over the pipeline.

Q It would be right over the pipeline?

A Yes.

Q And would the pipeline be anchored there, or would it be buried?

A It would be buried, yes.

Q What would happen if a boulder that size rolled over it, or on to it?

A The way that we planned to build it in that area, I don't think it would do anything, unless the terrific jar of the whole earth in that vicinity might snap a weld or something.

Q How would you propose to build it at that stage in order to protect it?

A We spent a long time at the Flood area, because that is serious, and along part of the Fraser River on the north,

... ..

...

...

...

...

...

...

...

...

...

...

...

...

...

...

...

...

...

...

...

...

...

...

...

...

A. B. Allyne,  
Cr. Ex. by Mr. S. B. Smith

- 868 -

you have the rock up against the river, between there and the railroad, which would not be satisfactory for pipeline construction, and then the railroad, and, oh, not more than five feet or six feet from the railroad the retaining wall now being built for the highway, and then the highway, and then the bluff.

Q Yes.

A We even considered running the pipeline flat on top of that retaining wall, but we abandoned that idea because while the way we had planned to build it would be safe from careening trucks and cars, it would not from a snowslide from above.

Q Or large boulders?

A A snowslide from above would bring rocks or trees down with it, and snap it like a soda straw, so that we went and talked to the Highway Department people there that have a branch office at Hope, and discussed with them their plans for the highway in that vicinity. They are continually doing work in that area. They plan to widen the highway out to 32 feet by shooting away this rock bluff. In addition to the 32 feet of highway they will have an 8 foot wide highway drainage ditch between the highway and the bluff, and our proposal at the present time is to place the pipeline underneath the drainage ditch, and then cover it up, and put a drainage ditch on top of it, providing the company finds the Highway Department sympathetic. If that cannot be worked out, then we would have to resort to something more drastic, but that would be a relatively simple solution, comparatively, to that particular problem.

Q Mr. Allyne, are you generally familiar with the route of the





A. B. Allyne,  
Cr. Ex. by Mr. S. B. Smith

- 869 -

Inter-provincial pipeline from Edmonton to Superior,  
Wisconsin? That is an oil pipeline?

A No, I am not, sir. Is that the new one that is presently  
being built?

Q It is presently under construction?

A I have heard of the line, but I am not familiar with it.

Q From Edmonton to the Great Lakes?

A I have never been in Canada east of Calgary.

Q Yes. Well, I would like to discuss with you for a few  
minutes some of the economic aspects of gas pipelines,  
and I have here an article in the Imperial Oil Review of  
December-January, 1949-50, dealing with the Inter-  
provincial pipeline from Edmonton to Superior, Wisconsin.  
I am going to put to you some of the statements made with  
respect to that pipeline, and ask you whether you agree  
generally with the sums of those statements, and whether by  
analogy they are applicable to gas pipeline construction  
also.

MR. NOLAN: That is an oil pipeline?

MR. S. B. Smith: Yes, I made it clear it is an oil  
pipeline.

Q This commences "From some points of view, a pipeline is  
simply an engineering problem. It's made up of steel  
and trenches and pumps and terminals. Looked at superfic-  
ially, a pipeline is just glorified plumbing." I suppose  
there wouldn't be much doubt about that. And it goes on,  
"But a pipeline has two ends and there are people at each  
end. And that simple, obvious fact, immediately makes a  
pipeline a problem in economics." There would be no doubt  
about the soundness of that statement?



A. B. Allyne,  
Cr. Ex. by Mr. S. B. Smith

- 870 -

A That is a good statement. It takes all the romance out of pipelining.

Q I have been here for some weeks, and I have been trying to find out some romance in it myself. "No longer a dead piece of machinery, it becomes a vehicle through which one group, the oil producers, serves another group, the oil consumers." And that would be applicable to a gas line also, would it not?

A That is true.

Q "In the process petroleum moves one way and money moves the other way, and that is economics." Would you agree with that?

A Yes.

Q And that is applicable to a gas pipeline?

A Yes.

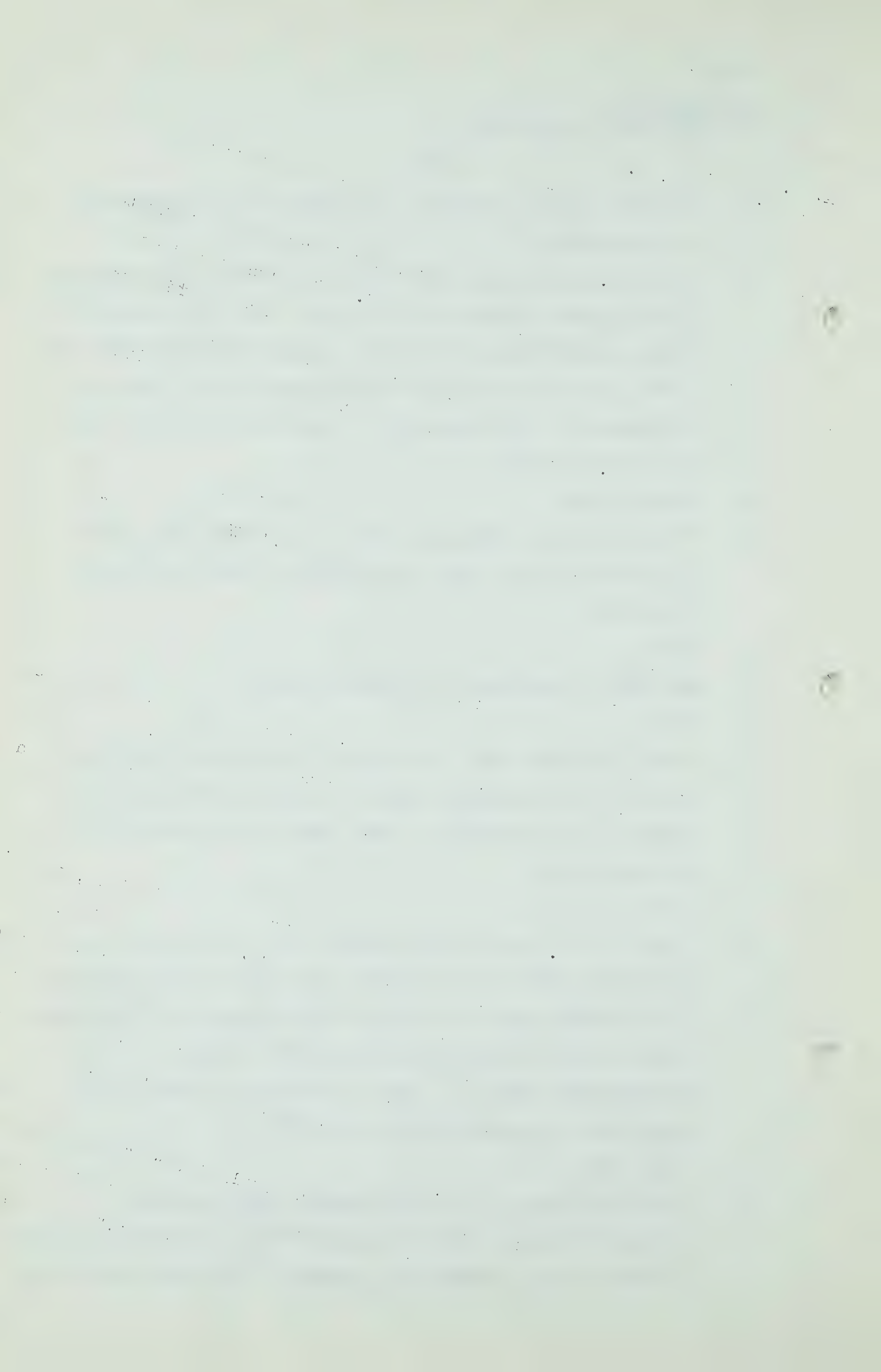
Q "And it follows that the line must satisfy the people at each end, the producers and the consumers, if it is to be sound in its economics." And that is applicable to a gas pipe line?

A Yes.

Q "Let's look first at the start of the pipeline, the oil producer's side of the picture. To keep in business, the oil producer has to be able to do two things - he has to be able to find oil and he has to be able to sell it at a satisfactory price." That is obvious, and that would apply also to gas production, wouldn't it?

A Yes, sir.

Q And then it goes on a little later, "Right here the producer comes up against one of the basic facts of economics oil has to pay its own way to market." Does gas have to pay





A. B. Allyne,  
Cr. Ex. by Mr. S. B. Smith

-871 -

its own way to market?

A Would you read that again, please?

Q "Right here the producer comes up against one of the basic facts of economics - oil has to pay its own way to market."

A You mean from one end of the pipeline to the other?

Q Yes? I suppose that is what it means.

A Yes.

Q In other words, you have got to pay to carry it over, and the product has to bear the cost that is being borne. I suppose that is what it means. "When the producer looks at crude oil prices in some distant market, he must always remember that he doesn't get that price for crude until it is delivered." And that would apply to gas too?

A Yes, if it is in one end and out of the other.

Q Yes. And this article goes on, "But suppose you gave the producer a choice between two pipelines? Suppose one of them found a roundabout or hilly route at high cost, and the other followed a straight flat route at low cost, but that both of them ended at the same destination. Here again the answer is obvious. The producer will choose the low cost route because that will give him a better price at his wells and enable him to reach a larger market."

Would you agree with that statement?

A Everything else being equal.

Q And it would be applicable to gas?

A Yes.

Q "He'll put his oil into the low cost line every time, just as a farmer will send his produce to market by the most direct, most economical route and so be able to get better





A. B. Allyn,  
Cr. Ex. by Mr. S. B. Smith

- 872 -

prices and supply more customers." I suppose you would agree with that?

A Yes.

Q And this goes on, "And it goes without saying that if the oil producer is satisfied with the amount of oil he can sell and prices he can get for it, he'll go vigorously about his work and if there is oil to be found, he'll find it." In other words, development of markets stimulates the production of oil, and that follows in the case of gas too, does it?

A Yes, sir.

Q "Cut off his markets or drive his price too low and he can't afford to keep looking for oil. He'll have to go somewhere else or take up some other line of business." You would agree with that?

A Yes.

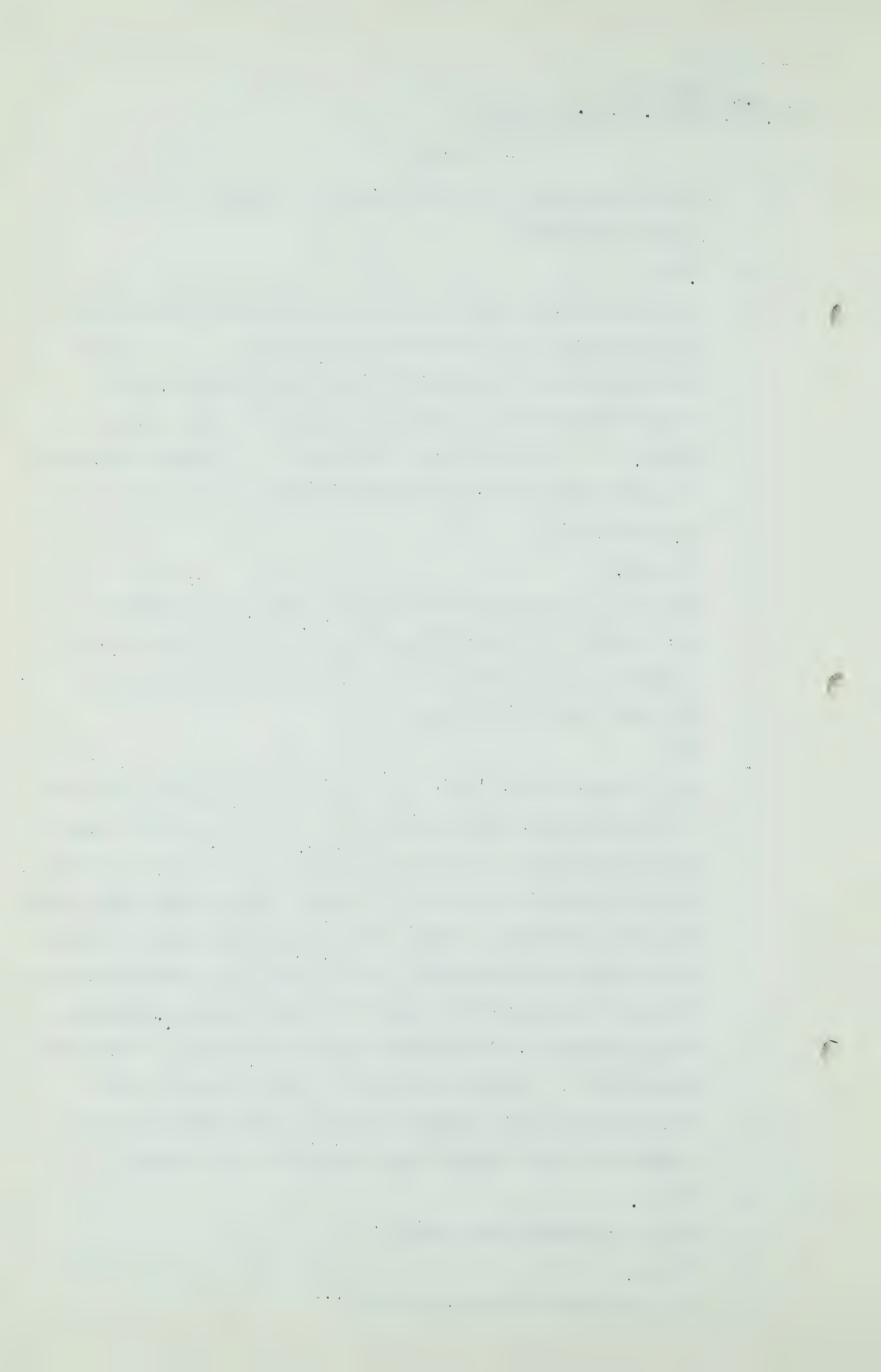
Q Now, this goes on, "Now, let's take a look at the other end of the pipeline, the end where the refiner takes oil out to process and pass on to the consumer. Here, too, you will find the same interest in the lowest possible transport cost, but for a different reason. The refiner wants oil to reach him in adequate quantities and as cheaply as possible because it means lower costs for himself, lower prices to attract more customers, and stability for his business." That seems reasonable. And in the case of carrying gas to the Pacific Coast, the evidence is quite clear that it is in competition with bunker fuels carried on tide water?

A Yes.

Q That is a competitive fuel?

A Yes.

Q And then this article goes on...



A. B. Allyne,  
Cr. Ex. by Mr. S. B. Smith

- 873 -

MR. C. E. SMITH: Is there some more of it?

MR. S. B. SMITH: We are going to go into this in a little more detail, if you do not object.

MR. C. E. SMITH: Oh, no.

Q MR. S. B. SMITH: "So, here you have two groups of people, the producers at one end and the consumers at the other, both of whom want to see the pipeline as straight and efficient as it can possibly be. The producers want to see it laid efficiently so that they can get the best possible returns. The consumers want to see it laid efficiently so that the greatest possible number of consumers will get the price benefit that results." Now, this goes on, "This explains why the pipeline will run in as straight a line as possible, down across the prairies and over the International Boundary to Superior, Wisconsin." You will agree with me as to the reasonableness of that?

A With the limited knowledge I have, yes.

Q "The same reasons explain why the line is going down to a United States port instead of remaining in Canada, to come out at one of the Canadian ports on Lake Superior. An all-Canadian route would add 121 miles of rough country to the line, a distance that would add some 12% to its cost. It would also increase the cost of operating the line by approximately 20%, a rather serious obstacle to the movement of oil through the line." I suppose you are not familiar with the comparative costs of the two routes that we are considering on this application?

A No, I am not.

Q But if a line costs more, that fact alone makes it more expensive to carry oil or gas through it?

10-11



A. B. Allyn,  
Cr. Ex. by Mr. S. B. Smith

-874 -

A The fixed charges are greater, yes..

Q The fixed charges are greater?

A Yes.

Q And if it is true, one line is through rough country and another line is through better pipeline country, maintenance costs are higher?

A You would expect them to be.

Q And the result is that it would cost more to carry the gas through the line?

A Yes.

Q But besides the producers and the consumerz, there is another important group who are interested in seeing the line built and operated as economically and efficiently as possible. These are the people who are connected with the operating and financing of the line itself." That would be so?

A Yes.

Q "This is the group which has to take the risks and make the decisions. On them is the responsibility to see that the line is built in such a way that it will carry its full quota of petroleum. They have to keep the line operating at the highest possible level, which means that they must so arrange things that producers will put plenty of oil in at one end and consumers take it all out at the other." Would you agree with that statement?

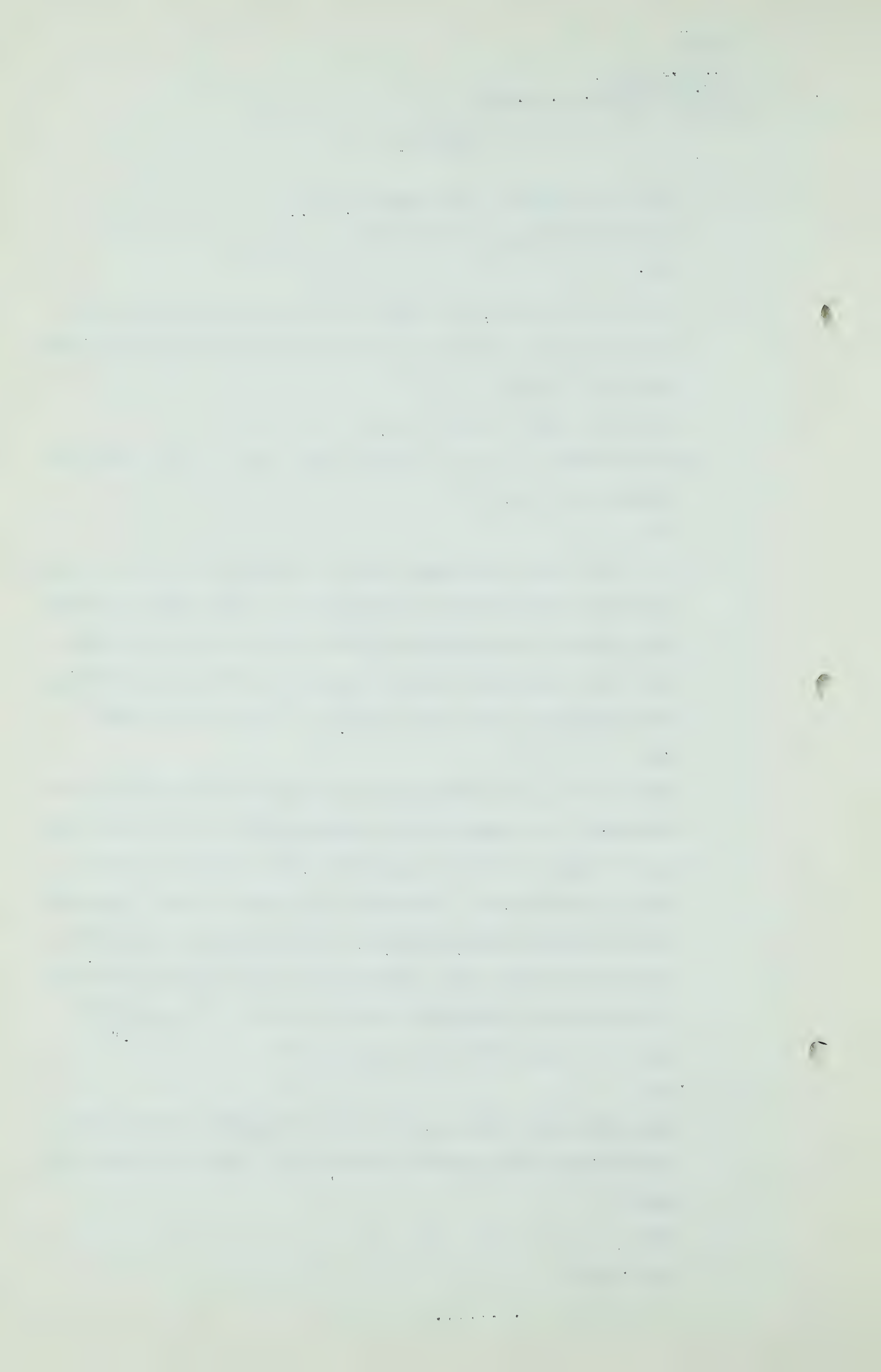
A Yes.

Q "Anything which would reduce the throughput would be bad business for the pipeline operators." Would you agree with that?

A Yes.

Q All right.

.....



A. B. Allyne,  
Cr.Ex.by Mr. C.E. Smith

- 875 -

CROSS-EXAMINATION BY MR. C. E. SMITH:

- Q Just one question if nobody else wants to ask any.  
As I understood your remarks about your company, Mr. Allyne, I take it that you are in a position as consultants and advisers to financial houses, including trust companies, insurance companies, when they are going to invest some of their money, that sort of business?
- A We do a good deal of that business, yes.
- Q I would take that from what you have told us, that you must have. Have you been asked by anybody of that nature, or by anybody or any of the applicants here, that is, your company, to make any estimate of reserves that would be of assistance to this Board, reserves of gas in this Province?
- A Not to my knowledge, no, sir.
- Q You would probably know that if your company were?
- A Yes, I would think so, I hope so.
- Q In view of the fact that you have come up here personally?
- A I would think so but I haven't heard it.
- Q But you do that kind of work, I take it?
- A Yes.
- Q I mean, very considerably so?
- A Not a great deal of work on reserves, no, sir.
- Q Not a great deal of work on reserves
- A No.
- Q I did not think there was very much left out that your large corporation does not do. I am not being funny about that?
- A No. Most oil and gas companies<sup>that</sup> are in the producing field retain their own geologists.
- Q Most companies retain their own geologists?



A. B. Allyne,  
Cr. Ex. by Mr. C. E. Smith  
Cr. Ex. by Mr. D. P. McDonald

- 876 -

A Yes.

Q Have you any departments that cover that situation?

A No, sir, not at the present time.

Q That is all.

.....

CROSS-EXAMINATION BY MR. D. P. McDONALD:

Q There is one thing, Mr. Allyne, can you tell me this, how many employees you would have in this spread that we were discussing?

A I haven't added it up, Mr. McDonald, but normally we figure about 300 men to a spread.

Q That includes the office staff?

A Yes.

Q And the whole works?

A Yes.

Q That is the figure I had in mind, was 300?

A Yes.

Q And in your examination in chief by Mr. Nolan you referred to normal rates for this type of work. Now, what are the normal rates you were referring to?

A Do you mean costs?

Q Yes, costs for the work that you have given us the figures for in this exhibit?

A Well, as I stated, in a normal pipeline country where you do not have these serious mountain conditions....

Q These difficulties, yes?

A ....a pipeline complete costs anywhere from \$1900.00 to \$2300.00 or \$2400.00 per inch mile.

Q That includes the pipe?

A Yes, that is the complete pipeline.





A. B. Allyn,  
Cr. Ex. by Mr. D. P. McDonald

- 877 -

Q I am thinking only of installation costs?

A Normally the installation cost is a little less than half of the total costs, so you would come out roughly on the contract portion only of somewhere around \$1000.00 per inch mile for the construction cost only. Now, if you are referring to the Class 1 type of construction, it just so happens that it costs \$23,800.00 per mile for a 24 inch line, which is practically \$1000.00 per inch mile.

Q As I understood you to say, the normal laying costs in the United States today, or in 1949, for a normal easy-going construction, is \$2300.00 -no, \$23,800.00 a mile?

A For that size pipeline.

Q For a 24 inch pipe line?

A Yes. I have figures on a number of pipelines apart from that, if you would like to have them.

Q Yes?

A Would you like to have some examples?

Q Yes, if you have them available?

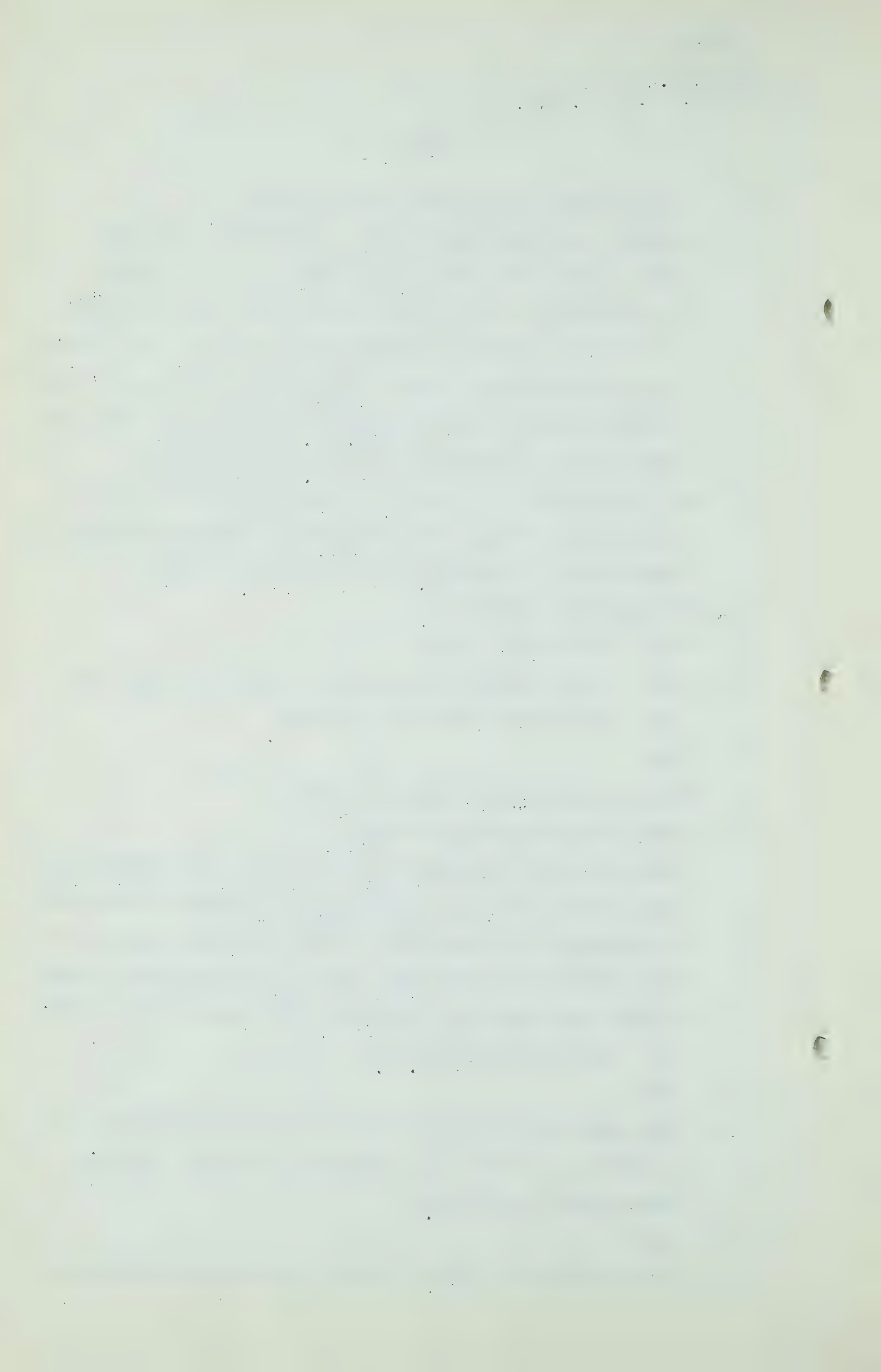
A Well, this is a tabulation which is part of my estimating file, and it shows some 20 pipelines which were authorized or pending before the Federal Power Commission during the period 1945 to December 1947, and is dated June 23rd, 1948. We have the United Gas Pipelines, 147 miles of 24 inch cost per inch mile of \$2,080.00.

Q Yes?

A They vary all the way from small lines to large lines. I am going to pick out just those that we might consider cross-country pipelines.

Q Yes?

A It is not in this Table, but the lines we just completed,



A. B. Allyne,  
Cr. Ex. by Mr. D. P. McDonald.

- 878 -

a 22 inch pipeline for the East Tennessee Natural Gas Company, comes to about \$2300.00 per inch mile complete.

Q Yes?

A There are other lines, United Fuel Gas Company, 16 inch and 20 inch, totalling an aggregate sum of \$4,000,000.00 for construction, they run respectively \$1790.00 per inch mile and \$2130.00 per inch mile, and \$2700.00 per inch mile. They vary all over the map.

Q That includes the pipeline complete with compressors and everything else, or does that include compressors?

A No, I do not believe it does; it is exclusive of compressors.

Q It is exclusive of compressors?

A Yes.

Q That includes the valves and everything else?

A Yes, valves and everything else.

Q You have not any figures for 1949 construction, except this one that you are talking about?

A Except the one in East Tennessee.

Q The one you were referring to?

A Yes, the East Tennessee.

Q This Toughest Inch that was referred to a few minutes ago?

A I do not know what the total cost in that would be.

Q You have not the figures on the actual construction of the Michigan-Wisconsin line that was just completed a little while ago?

A No, I do not have anything on that.

Q All right.

THE CHAIRMAN:

Thank you, Mr. Allyne.

MR. NOLAN:

I am just wondering, sir, whether in view of the fact that we have all been working overtime





this afternoon, that it would be too much to bring in a new witness now. I intended to call Mr. Dixon on the design of the line, and he will be the first witness in the morning, and I am going to suggest to the Board that we adjourn now until half past nine tomorrow morning.

THE CHAIRMAN: We will adjourn until half past nine tomorrow morning.

(Hearing adjourned until 9.30 A.M. June 9th, 1950).

.....









